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Publication date:
2009

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
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Publisher
Forest & Landscape Denmark
University of Copenhagen
Hørsholm Kongevej 11
DK-2970 Hørsholm
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Series-title and no.
Forest & Landscape Working Papers no. 34-2009 published on www.sl.life.ku.dk

ISBN

DTP
Melita Jørgensen

Citation

Citation allowed with clear source indication
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Preface

Denmark has a long-standing tradition for working with applied forest genetics based on seed from selected, healthy, productive and straight elite trees. Over the previous 60 years this work has implied a close cooperation between the Arboretum in Horsholm and The Tree Improvement Station in Humlebæk. The Arboretum (since 2004 a part of Forest & Landscape, University of Copenhagen) has over the years selected, developed and tested superior seed-trees, whilst The Tree Improvement Station (today a part of The National Forest & Nature Agency, Øresund) has worked with effective propagation and distribution of improved material on a national scale. Strategies as well as tangible plans are regularly discussed and coordinated. The cooperation has been a strong link between research on the one side and forestry on the other, and since 1947 the Forest and Nature Agency has established, managed and harvested seed from an extensive network of seed sources, which, as far as seed orchards are concerned, have all been established in interaction with Forest & Landscape for breeding purposes.

One of the first seed orchards in the systematic breeding work is FP202. Selection and grafting of particularly interesting ash trees was started in 1934 in the Forest Botanical Garden under C. Syrach-Larsens direction (Larsen, 1945). In 1945-46 there was a large scale propagation of 14 selected clones. Helmuth von Barner was responsible for planting 977 of these graftings at an area close to the newly started Tree Improvement Station in 1947, thereby establishing the (to our knowledge) World’s first Ash seed orchard. FP202 has since developed into one of the most important seed sources of ash in Danish forestry. In later years it has been the preferred seed source in Danish Forestry due to its origin from straight trees, but also because FP202 is expected to have the highest level of genetic diversity among the three ash seed orchards on the Danish market.

Due to the recent problems with ash dieback, special interest for the clones in FP202 has arisen. Dieback is supposedly caused by a fungus ‘Chalara fraxinea’. Though there are still many unanswered questions concerning this serious illness (Thomsen et al., 2008), it is very interesting that some clones show considerable resistance. FP202 contains both resistant and susceptible clones, and since 2007 it has become particularly interesting to study progenies from FP202 in order to increase the understanding of the genetic aspects of the disease and the option for breeding to increase resistance (Olrik et al., 2007). This work has included selective harvest from healthy clones in 2008.

Many years have passed since the first elite ash tree was selected and grafted in the 1930’ies, and there are many steps where mistakes could have occurred since. It is not possible to discern clones from each other by their appearance, and correctness of the clone identity in FP202 is therefore completely dependent on the high degree of care taken by all those involved from 1930’ies up to today. Fortunately, it is now possible to control the clone identity by DNA markers, and with this knowledge we decided to
control the clone identity of FP202, 60 years later. This report deals with the technique, results and conclusions of the analysis. In the appendix we have selected documentation concerning FP202’s establishment and treatment material which has only partly been published earlier.

Helmuth von Barner and C. Syrach-Larsen (who founded and managed the seed orchard for more than 40 years) would have been delighted by the results. There are only very few technical errors in this the (maybe) oldest ash seed orchard in the world.

Hørsholm og Humlebæk, December, 2008

Erik Dahl Kjær, Lars Graudal og Bjerne Ditlevsen
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Appendix 2: Description of FP202, 1976 25
Appendix 3: Selection and propagation of clones in FP202 (1938-1944) 28
The *Fraxinus excelsior* clonal seed orchard FP202 was established at Birke-
marken, Humlebæk, Denmark in 1947, and is to our knowledge the first
*Fraxinus* clonal seed orchard established worldwide. 61 years after estab-
ishment we tested clonal identity of remaining ramets by application of 4
polymorphic SSR markers. FP202 consists of alternating rows of the pre-
dominant male clone V282, and 8 predominant female clones: V702, V703,
V704, V710, V791, V792, V793, V797. However, unpublished observations
suggest that V797 may have substantial contribution to the male gamete
pool, and that the gender function of V793 also is uncertain.

Among ramets labelled as V702, V703, V704, V710, V791, V792, V793,
V797 a single genotypic mismatch was observed (Tree 24-02, probably a
rootstock). Further, one V791 ramet was mistakenly labelled V282 (Tree
09-03). An important additional finding was that V702 and V703 ramets
had identical genotypes and therefore most likely originates from the same
ortet. We cannot infer from the data if it is V702 or V703 that is the correct
name. 60 of the ramets labelled V282 (male) had identical genotypes, but 5
ramets had an alternative genotype suggesting that they form an extra male
clonal represented by 5 ramets scattered in the V282 rows. The origin of this
clonal is unknown, but is probably introduced by mistake during the graft-
tings in 1945-46. A single ramet labelled V282 is probably a root stock.

*To conclude:* 115 trees (93%) had a DNA profile that fits the documentation
even though it shall be noted that V702 and V703 ramets probably form a
single clone. 8 trees deviated from the expected: 2 trees are likely root stocks,
1 tree had an incorrect label, and 5 trees form an additional clone of so-far
unknown origin.
Danish summary

Træer i aske klonfroplantagen FP202 (Birkemarken) blev undersøgt med DNA markører for at kontrollere deres klonidentitet. FP202 består (ifølge anlægsrapport og øvrig dokumentation) af rækker med (overvejende) hanlige træer (alle klon V282) som alternerer med rækker af overvejende hunlige trær (8 kloner rækkevis: V702, V703, V704, V710, V791, V792, V793, V797). Det skal dog bemærkes at Helmuth Barner i 1976 indikerer at V797 sandsynligvis er hanlig (♂?) og at V793 er tvilsom i forhold til hanlig/hunlighed (cf. Appendix 2, nedenfor), selvom begge kloner producerede en del frø i plantagens unge år (cf. Appendix 1, nedenfor).

Resultaterne af DNA analysen er sammenstillet i Figur 1 og Tabel 2. Baseret på DNA analyserne konkluderer vi, at der i hunrækkerne kun forekommer én afvigelse (vi antager der er tale om en grundstamme). Dog bemærkes at to af de hunlige kloner (V702 og V703) med stor sandsynlighed er identiske idet de har samme DNA profil. Blandt de 67 træer i hanrækker identificerede vi ét træ som ikke passede med de øvrige, men i stedet kunne identificeres som V791. 60 træer i hanrækkerne havde identisk genotype, som vi derfor antager er V282. 5 træer spredt i hanrækkerne havde identiske genotyper, som dog afvej fra øvrige, og vi konkluderer på den baggrund at froplantagen indeholder én ekstra klon repræsenteret med 5 rameter. Denne klon er sandsynligvis introduceret ved en fejl under podearbejdet i 1945-46, men oprindelsen af klonen er usikker. Endelig observerede vi ét træ i hanrækkerne, hvis genotype afveg fra alle andre træer, og vi derfor antager er en grundstamme. I alt 115 ud af de 123 undersøgte træer (93%) havde således en DNA profil som passede med det forventede ifølge dokumentationen. Et enkelt træ blev af tekniske grunde ikke undersøgt og indgår derfor ikke i analyserne.

Konklusion: Froplantagen indeholder 124 træer, hvoraf 8 træer har en DNA profil som afviger fra forventningen ud fra dokumentationen: 2 træer antages at være grundstammer, 1 træ antages plantet forkert i forhold til kortet (evt. forbyttet podekvist), 5 træer udgør én ekstra klon fordelt i hanrækkerne. DNA-analysen afslørede desuden at V702 og V703 må antages at være samme klon uden det er muligt at afgøre om det er V702 eller V703 som er den korrekte betegnelse.
1. Introduction

The *Fraxinus excelsior* clonal seed orchard FP202 located at Birkemarken close to the Danish Tree Improvement Station in Humlebæk, is the second oldest existing clonal seed orchard in Denmark. Further, it is to our knowledge the first clonal *Fraxinus* seed orchard established world wise.

The seed orchard has been one of the main providers of *Fraxinus* seed to Danish Forestry since the 1960’ies and is still one of the most used seed sources in Denmark. This would be sufficient reason for investing time and effort in validating the clonal identity of the trees in this old seed orchard. However, a new severe disease which was first observed in 2003, has infected the Danish ash trees dramatically, threatening the use of this important species (Thomsen *et al.*, 2008). In 2007 significant variation was observed between clones in their degree of susceptibility (Olrik *et al.*, 2007) and these important differences have been maintained in 2008. The findings were based on a clonal trial with 40 clones tested at two locations (CSOs). Fortunately, the old *Fraxinus* FP 202 seed orchard includes some of the best performing clones, but also some of the inferior ones. For this reason, the verification of clonal identity in the seed orchard has become increasingly important.

In 2008 it was decided to collect seed exclusively from the healthy clones in the seed orchard. Seeds on these trees are presumably sired by the healthy clone (V282), and the expectation is therefore that such seed would have increased resistance against the disease. However, in order to be able to study such parent-offspring regression as well as in order to ensure seed collection from the correct trees, it was decided in 2008 to perform a full test of clonal identity of all trees in the seed orchard.

The present survey thus has three objectives: (i) to check the clonal seed orchard for «cryptic dysfunctions» due to grafting mistakes or seed/pollen production from root stock (cf. Hansen & Kjær, 2006), (ii) ensure seed collection from correct trees during exclusive seed collection, (iii) to facilitate precise comparison of parent-offspring regression in health and thereby allow studies on heritability and genetic background for the apparent resistance (to be studied in 2009).

The present report documents the applied methods and results of this survey with the three above objectives.
2. The Seed orchard

Establishment and management of the seed orchards are described in some detail in old reports and other written material mainly authored by Helmuth Barner, the director of the Tree Improvement station from its establishment in 1947 until 1988. Two key reports are reproduced in appendix 1 and 2, from where the below description has been extracted:

The seed orchard was established with graftings in 1947 on agricultural land. A total of 14 clones were included, 1 predominantly male clone and 13 predominantly female clones (Appendix 1). Brief description of plus trees and grafting work are included in Appendix 3, and pictures of the majority of the plus trees are included in Appendix 1. The establishment phase included mechanical weeding. Pruning of branches was applied in 1953 and 1954 to increase seed set, but with very limited effect. Application of fertiliser and removal of grass did increase the health and growth of the seed orchard trees, but did not lead to substantial seed yield (Appendix 1).

5 of the female clones were removed in 1961, leaving only 8 predominantly females (V702, V703, V704, V710, V791, V792, V793, V797), and one predominantly male (V282). However, in 1976, Helmut Barner questions if V793 and V797 are truly predominantly females (cf. Appendix 2), and these 2 clones may therefore also be important pollen donors in the Seed orchard. Further information on the selection and propagation of the individual clones are included in Appendix 3.
3. Methods

**Sampling**
Leaf material was collected on September 10th 2008. Two leaves were collected from each tree throughout the seed orchard. Each sample was labelled according to their position on the map (Figure 1). In total, 67 samples were collected from the male rows (presumed V282) and 56 samples from the female rows (presumed V702, V703, V704, V710, V791, V792, V793, V797). The material was stored at -20 °C until DNA extraction.

**Genotyping**
15-20 mg leaf tissue per individual was treated with liquid nitrogen and ground on a bead mill without any prior preparation. DNA extraction was carried out with the DNeasy 96 Plant Kit from QIAGEN following the manufacture's protocol for frozen material.

The DNA-extractions were kept undiluted for the polymerase chain reaction. Eleven primer pairs developed for *Fraxinus excelsior* were initially tested. Ten of these (FEMSATL1, 2, 4, 5, 8, 10, 11, 12, 16, 19) were all developed by Lefort *et al.* (1999). FEMSATL12 has later been modified by Gerard *et al.* (2006) and it was the modified version that we tested. The last primer pair (M2-30) was developed by Brachet *et al.* (1999). Four polymorphic, interpretable microsatellite loci were identified and used for further genotyping. The chosen primer pairs were FEMSATL11, FEMSATL12, FEMSATL16, FEMSATL19.

PCR reactions were carried out using the Qiagen Multiplex PCR kit according to the manufacturer's instructions except that the reaction volumes were scaled down to 15μl. PCR-amplifications were completed on Perkin Elmer Thermo cyclers (models 9700 and 2700) under the following conditions: an initial denaturation step of 15 min at 95 °C, 30 cycles of denaturation at 94 °C for 30 s, annealing at 57 °C for 90 s and extension at 72 °C for 60 s, and a final extension step at 60 °C for 30 min. Each amplified product was diluted with 30μl H₂O and visualized with an ABI3130xl sequencer from Applied Biosystems.
4. Results

In Table 1 we see that the amplification of the 4 microsatellite loci in total resulted in 35 alleles. This level of polymorphism was highly sufficient to distinguish between the genotyped clones.

Table 1. Number of alleles per microsatellite locus. The alleles are given in base pairs

<table>
<thead>
<tr>
<th></th>
<th>Femsatl11</th>
<th>Femsatl12</th>
<th>Femsatl16</th>
<th>Femsatl19</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>183</td>
<td>172</td>
<td>186</td>
<td>174</td>
</tr>
<tr>
<td>2</td>
<td>185</td>
<td>174</td>
<td>188</td>
<td>176</td>
</tr>
<tr>
<td>3</td>
<td>191</td>
<td>176</td>
<td>196</td>
<td>180</td>
</tr>
<tr>
<td>4</td>
<td>193</td>
<td>178</td>
<td>200</td>
<td>182</td>
</tr>
<tr>
<td>5</td>
<td>197</td>
<td>190</td>
<td>186</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>201</td>
<td>196</td>
<td></td>
<td>188</td>
</tr>
<tr>
<td>7</td>
<td>203</td>
<td>198</td>
<td></td>
<td>190</td>
</tr>
<tr>
<td>8</td>
<td>205</td>
<td>200</td>
<td></td>
<td>192</td>
</tr>
<tr>
<td>9</td>
<td>213</td>
<td>204</td>
<td></td>
<td>194</td>
</tr>
<tr>
<td>10</td>
<td>206</td>
<td></td>
<td></td>
<td>198</td>
</tr>
<tr>
<td>11</td>
<td>211</td>
<td></td>
<td></td>
<td>202</td>
</tr>
</tbody>
</table>

Of the 67 examined male trees (labelled V282) it turned out that 60 ramets had identical genotype (recognized as V282, Table 2). The remaining seven were of a different genotype. One (position 0905) turned out to have same genotype as V791 and may thus be a wrong grafting. One was not recognized elsewhere (position 0307) and may be a root stock. The last 5 (positions 0107, 0901, 0909, 1505, 1903) all had the same genotype (see Table 2) that did not match with any of the others.

Among the female rows, only 1 tree (labelled V702, position 2402) did not resemble any other genotype and may thus be a root stock. However, very interestingly trees labelled V702 and V703 turned out to have identical genotype, and it is therefore very likely that they originate from the same ortet (≡ the same clone).
Figure 1. Positions of trees with deviating genotypes compared to documentation. Marked in red: »Extra male« = five trees with identical genotypes that are not identical to the V282 genotype. The two squares show the trees with no match. V702 and V703 turned out to have identical genotypes.
Table 2. Summary of the genotypes of the clones of *Fraxinus excelsior* from Birkemarken (seed orchard FP202). Alleles are given in base pair lengths at each of the 4 loci.

<table>
<thead>
<tr>
<th>Clone ID</th>
<th>Femsat11</th>
<th>Femsat12</th>
<th>Femsat16</th>
<th>Femsat19</th>
</tr>
</thead>
<tbody>
<tr>
<td>V282</td>
<td>183</td>
<td>201</td>
<td>174</td>
<td>174</td>
</tr>
<tr>
<td>V702</td>
<td>191</td>
<td>205</td>
<td>176</td>
<td>196</td>
</tr>
<tr>
<td>V703</td>
<td>191</td>
<td>205</td>
<td>176</td>
<td>196</td>
</tr>
<tr>
<td>V704</td>
<td>193</td>
<td>213</td>
<td>190</td>
<td>206</td>
</tr>
<tr>
<td>V710</td>
<td>183</td>
<td>203</td>
<td>172</td>
<td>190</td>
</tr>
<tr>
<td>V791</td>
<td>185</td>
<td>191</td>
<td>174</td>
<td>178</td>
</tr>
<tr>
<td>V792</td>
<td>183</td>
<td>191</td>
<td>174</td>
<td>174</td>
</tr>
<tr>
<td>V793</td>
<td>183</td>
<td>191</td>
<td>200</td>
<td>204</td>
</tr>
<tr>
<td>V797</td>
<td>197</td>
<td>205</td>
<td>190</td>
<td>200</td>
</tr>
<tr>
<td>Extra male</td>
<td>183</td>
<td>191</td>
<td>174</td>
<td>190</td>
</tr>
<tr>
<td>(0107, 0901, 0909, 1505, 1903)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male with no match (0307)</td>
<td>193</td>
<td>205</td>
<td>174</td>
<td>211</td>
</tr>
<tr>
<td>Female with no match (2402)</td>
<td>197</td>
<td>201</td>
<td>190</td>
<td>198</td>
</tr>
</tbody>
</table>

Please note that V702 and V703 have identical genotypes and it is therefore highly likely that it is indeed the same clone.
5. Conclusion

In conclusion, the seed orchard corresponded to 7 clones in female rows and 2 clones in the male rows rather than 8 clones in female rows and 1 clone in male rows. Besides this, there were only few unexplained deviations (1 assumed wrong/misplaced grafting, and 2 likely root stocks). According to old records, 2 of the clones in the female rows may produce significant amount of pollen and the pollen production is therefore likely to be distributed on more than one clone.

The identity of the »extra male« remains unknown. We have genotyped 40 clones deployed in different Danish seed orchards, but none of these match (Nielsen, unpublished results). A screening of old clonal archives with *Fraxinus* may reveal the true identity of this »extra male«, but this will probably not be an easy matter. Studies of segregation in terms of health of progenies from FP202 will be performed in 2008-2009, and here we will look for progenies sired by this »extra male«. Based on this parental analysis we expect to be able to determine the health status (in terms of breeding value) of the »extra male«. This will only be possible if the clone has been sufficiently male fertile to sire a fair number of progenies in our progeny sample. Based on the results it will be possible to recommend if the clone should be removed from the seed orchard or maintained.
6. References

Rapid identification of microsatellite loci using 5' anchored PCR in the common ash (Fraxinus excelsior). Molecular Ecology 8, 157–168.


Paternity analysis with microsatellites in a Danish Abies nordmanniana clonal seed orchard reveals dysfunctions. Canadian Journal of Forest Research 36, 1054–1058.

Larsen, C.S. 1945.

Identification and characterisation of microsatellite loci in ash (Fraxinus excelsior L.) and their conservation in the olive family (Oleaceae). Molecular Ecology 8, 1088–1091.

Klonforskelle i angreb af asketoptørre. SKOVEN 39, 522–525.

Pruning has been applied to increase fruiting and ease seed collection (cf. Annex 1 below). Many trees therefore have low twigs. However, today the clonal identity is correct on most trees and the DNA analysis only identifies two trees to be likely root stock. This result proves careful pruning and removal of root stock sprouts in the seed orchard.
Appendix 1: Description of the establishment of FP202

Source: Selected part of the unpublished document ‘Frøhaver Ask’, which is part of the old files at the Arboretum. The file is undated and the authorship is not stated. We believe it was written by Helmuth Barner, the former director of The Danish National Tree Improvement Station, who was responsible for the establishment and management of the seed orchard.

We are not sure about the date. The document refers to the flowering in 1960, and is likely to be prior to 1961, because it does not refer to the thinning of the clonal seed orchard that was performed in that year according to documents from 1976 (appendix 2 below). The document include numbers of seed harvested up till 1966/67, but these figures may have been added later as no references are given to flowering after 1960. We therefore assume that the document dates around autumn 1960.
Planteavlsstationen
Birkemarke
Areal: 1,5 ha.

Ansk
Pehave 202.

Formål: Produktion af askerø.

Isolering: Isolerer fra omgivende ask ret godt, ca. 500 m gennem skov til nærmeste askesvevokning, der er gammel og næppe blomstrer mere.

Arvemateriale: Som huntrer indgår i plantagen følgende, der er udvalgt af dr. Syrach Larsen:

| V. 702 | Standerup: Nørreskov afd. 12 tre nr. 1 | 80 stk. | podet 1946 |
| V. 703 | rolle | 10 | 2 | 80 | okul. 1945 |
| V. 704 | Boller: Nederkøv afd. 30 | 40 | - | podet 1946 |
| V. 710 | Tåsinge: Horsø skov afd. 5 | 40 | - | 1945 |
| V. 793 | Sore I: Ibro Vesterkøv afd. 63 a | 60 | - | okul. 1945 |
| V. 792 | Sore II: St. Bøgeskov afd. 67 a | 20 | - | 1945 |
| V. 793 | Sore III: H. Bøgeskov afd. 82 a Frfl. F.K. 60 | - | - | podet 1946 |
| V. 797 | Hersholm: Staaevang afd. 274 tre nr. 1 | 40 | - | okul. 1945 |
| V. 869 | Skovstrup: Balby Skov afd. 23 a | 4 | - | 1945 |
| V. 894 | Bregentved: Grønåskevnen afd. 90 | 4 | - | 1945 |
| V. 895 | Bregentved: - - - 112 | 2 | - | 1945 |
| V. 896 | Bregentved: - - "Jubilæumsasken" | 5 | - | 1945 |
| V. 898 | Svenstrup, Kimmerslev, Køn the afd. 11 | 2 | - | 1945 |

Som han er anvendt V. 282 Standerup Nørreskov.

Frfl. F.O. Tre nr. 44. 500 stk. (til og med 5 rk. 10. plt. p. 46 (derfra og til og med 34 rk. 16. plt.) fra (ok.47, resten ok. 44 (syd)

Plantagen er anlagt i foråret 1947 i den østligste del af Birkemarke, V. 282 indgår med 2 rækker i hver anden dobbelt række, huntrerne indgår derimellom som vist på skitsen.

Alt materialet er leveret af Arboretum i Hersholm.

Planteafstand 4 x 4 m.

Plantagens udvikling: Plantagen blev anlagt på gl. agerjord, der lige efter overtagelsen blev behandlet med harvning, hvorefter askene blev udplantet. De første 3 år blev der til stadighed renholdet med harvning, hvorefter man indskrænkede sig til at holde græsset nøde med slåning.

For at prøve dels at påvirke fremsættningen, dels at lette plukningen, klippede man første gang i vinteren 1953/54 i rækkerne med huntrer, grenene ind på hveranden ask i hver række (i forbindelse). Dette blev gentaget i 1954/55 med de samme trær. - Intet udslag!
Efter at man i nogle år havde holdt arealet med gres, viste det sig, at askene hæmmede i udviklingen. Sidstene blev gullige, og væksten var særlig på midterarealet ringe.
I oktober 1957 fræede man derfor mellem alle askerækkerne (4 træk mellem 2 rækker ask). Følgende rækker mellemrum blev dog ikke fræede:

25 - 26 = v. 262
33 - 34 = v. 262
idet rækkerne regnes fra nord.
Umiddelbart herefter blev på tvers af rækkerne givet
7 rækker ask = 225 kg svovlsur ammoniak i alt
6 - - = intet
7 - - = 225 kg kalksalpeter i alt
I foråret 1958 blev følgende tilført:
7 rækker ask = 250 kg svovlsur ammoniak i alt
6 - - = intet
7 - - = 250 kg kalksalpeter i alt
Allerede tidligt på sommeren 1958 mås klart udslag for gødskningen, idet 2x7 gøede rækker fik mørkegrønne, munde blade. Der konstateredes ikke forskel på de 2 gødningssorter virkning.
Fortvbet 1959 gøedes hele arealet med 375 kg svovlsur am. og senere med 375 kg. Arealet blev i 1959 holdt med fræning og er i 1960 blevet harvet. Gødskning + fræning gav klart positivt udslag m.h.t. vækst.
I 1950/59 blev formelt en kraftig besættelse af hveranden 1 træ. Virkningen var, bedstet sommeren 1960, ikke særlig gunstig. Der har som frygtet udviklet sig kraftige varria på de beskjarte træer og blomstringen forår 1959 var ikke bedre på de beskjarte træer end på de andre træer.
1960 synes at være godt blomstringsår for ask. Blomstringen i frøhaven er dog beskeden og i lighed med de 2 tidligere blomstringsår, er der flest blonster i de laveste dele mod S. og N. Der er dog en nogenlunde god blomstring på 2 rækkerne også på midterstykket, hvilket tyder på, at der ikke alle er de ydre forhold, der hindrer 2 klonerne i blomstring på midterstykket.
Amk.
Sørs I, Broby Vesterkøv, afd. 63 a.
V. 791.
fot. den 29/1 -1954.

Amk.
Tåinge, Horre skov, afd. 5.
træ mark. 3 gulde platt. V. 710.
fot.

Amk.
V. 799.
fot. den 29/1 -1945.
Ask.
Bregentved, Sorte led afd. 112.
V. 695.
fot. den 15/1 - 1954.

Ask.
Svenstrup, Kimmerlev Hessel afd. 11.
V. 898.
fot. 6.22/1 - 1954.

Ask.
Bregentved, Jubilumsaasen.
V. 696.
fot. d. 22/1 - 1954.
Ank.
Stenderup Nørrekov, afd. 12.
træ nr. 1, V.702.

Ank.
Boller Nederstov, afd. 30.
træ (gul ring), V.704.
fot. den 30/1-44.

Ank.
Stenderup Nederkov, afd 30.
træ nr. 2, V.703.
Appendix 2: Description of FP202, 1976


PROVENIENSMEDDELELSE Nr. 7
STAMDOGBLAD
for
FRØPLANTAGE FP202

1. Identifikation
1. Træart: Ask, Fraxinus excelsior
2. Løbenummer: 262
4. Ansvarlig tilsynsfører: Plantevillstationen
6. Areal: 1,5 ha
7. Kort: A 2630

1. Fraets anvendelsesområde: Ingen særlige begrensninger inden for danske askelokaliteter.

3. Udvigelse
1. Komponenter | Antal | Antal | Formeringstræning | Udplantningsår | Frøbestand til
|-----------------|-------|-------|-------------------|----------------|----------------
|Kloner           |14     |5      |1945-46           |1947           |1/1-76
|Familier         |0      |0      |

3. Plantningsafstand: 4 x 4 m.
4. Isolering: Enkelte små askegrupper 200-300 m N.V., for plantagen, enkelte ask ca 450 m gennem skov V. og NV for plantagen, samt 2 små askevokseringer ca. 550-600 m gennem skov NV for plantagen.

4. Grundmateriale
1. Udgangsvokseringer. Flustræer valgt i sædeles gode og valformede askevokseringer.
2. Udvalgsssekseker. Efter kan for at få hønlige og hønlige kloner samt efter ræthed og stammevækst.
3. Udvalgsstyrke: Vanskelig at vurdere.

<table>
<thead>
<tr>
<th>Betegnelse</th>
<th>Sex</th>
<th>Oprindelses</th>
<th>Herkomst</th>
<th>Antal træer i plantagen</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1945</td>
</tr>
<tr>
<td>V 702 træ 1</td>
<td>♀</td>
<td>Formentlig dansk lokalrace</td>
<td>Stenderup, Nørreskov afd. 12</td>
<td>80</td>
</tr>
<tr>
<td>V 703 - 2</td>
<td>♀</td>
<td>lokalrace</td>
<td>Stenderup, Nørreskov afd. 10</td>
<td>80</td>
</tr>
<tr>
<td>V 704</td>
<td>♀</td>
<td></td>
<td>Boller, Nederstov afd. 50</td>
<td>40</td>
</tr>
<tr>
<td>V 710</td>
<td>♀</td>
<td></td>
<td>Tåsinge, Horskov afd. 5</td>
<td>40</td>
</tr>
<tr>
<td>V 791</td>
<td>♀</td>
<td></td>
<td>Sore I, Droby Vesterskov afd. 63a</td>
<td>80</td>
</tr>
<tr>
<td>V 792</td>
<td>♀</td>
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<td>Sore II, St. Bøge- skov afd. 67a</td>
<td>20</td>
</tr>
<tr>
<td>V 793</td>
<td>♀</td>
<td></td>
<td>Sore II, L2. Bøge- skov afd. 82a</td>
<td>80</td>
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<tr>
<td>V 797, træ 1</td>
<td>♀</td>
<td></td>
<td>Harsholm, Stasevæng afd. 274</td>
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</tr>
<tr>
<td>V 869</td>
<td>♀</td>
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<td>Svenstrup, Dalby afd. 23a</td>
<td>4</td>
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<tr>
<td>V 894</td>
<td>♀</td>
<td></td>
<td>Bregentved, Grevinde afd. 90</td>
<td>4</td>
</tr>
<tr>
<td>V 895</td>
<td>♀</td>
<td></td>
<td>- - 112</td>
<td>2</td>
</tr>
<tr>
<td>V 894</td>
<td>♀</td>
<td></td>
<td>Bregentved &quot;Jubilmumsask&quot;</td>
<td>5</td>
</tr>
<tr>
<td>V 898</td>
<td>♀</td>
<td></td>
<td>Svenstrup, Kimmerslev afd. 11</td>
<td>2</td>
</tr>
<tr>
<td>V 282 træ 44</td>
<td>♀</td>
<td></td>
<td>Stenderup, Nørreskov afd. 12</td>
<td>500</td>
</tr>
<tr>
<td>Ialt</td>
<td></td>
<td></td>
<td></td>
<td>977</td>
</tr>
</tbody>
</table>

6. Forventninger til fremplantagens afkom.

1. Udgangspopulationens niveau: Bevokseringer over middel.
4. Forventet kombinationseffekt: ?
Denne proveniensekselektion aflaser den tidligere udsendte proveniensekselektion før 7 af september 1963, der bedes udtages af samlingen.
Appendix 3: Selection and propagation of clones in FP202 (1938-1944)

Source: Scanned copies of original registrations made during 1938-1944. Unpublished records kept at Forest and Landscape, Faculty of Life Sciences, University of Copenhagen.

V282-1
Fra N. 44.
Det. for Dyrk.

Foran 1941: Ødelad 798 stk. af Askvits Kærkærde i plantet direkte fra Bæk.

4.1.41: Jernmangel juli 1941 af Dyrkoren, 19 stk. ikke blædt den.

13.1.41: 488 stk. med middelhjæl 113 cm, store Bøjler 100 cm.

26.1.41: Planter opløgter og sorting.

20.5.41: Smække, delte til Udpakning.

15  -  mes underrætning

835  -  til Løderkunder

148  -  til Pakning

15  -  Reserv

+ 4  -  haver paket fron. (frem. af tørklen af Dyrkoren Karine)
V702

26/1-44: Material hentet af E. Magiers, der beskriver Træet:

"Totalhøjde 29.3 m, Bredeøjde 15.0 m, Stem. 0.6 m

(afv. fra bestemte Maalinger). Træet har været jævnt
og rigeligt dænet med Frogler af hvilke en del ind-
ne ses sidst i bøg og dar kemmelig færd. Efter ha
Træet er hjælp af S.F.F. i stige og klippest med Stang-
saks. Materiallet til 1-300. Frodi vilde af de mel-
kippet grene indskulles af Træeren."

Skilt: E. Magier Rundting 5.2.

14-44: 1000 Kom.Vagl = 76.25 g.

7/3-44: Podd i Th. 12 stk.

1/4-44: Rød 10 stk.

2/5-44: Podd fra Hjemmehøjde 32 stk.

1/5-44: Rød 12 stk.

26/45: Podd i åge apok. 20 stk.

3/47: Rød 13 stk.

5/49: Træet fjedt i Storm (indskilt 32.5 cm)
V703

26/44: Materialer kendt af C. Magnus, der skriver:
"Tolthøjde 28.2 m, Amtshøjde 14.8 m, Øvæs. 35 cm
(Skn. Hans Christian). Også dette fra har brunt
jemte cirka guld. For, men her var ikke det nogen
hellige og det var mange lidt, som det næste falde
af, men gennem faldt til jorden."

Skifter: Magnus Rasmussen S.K.

44/44: 1000-kg vagt: 76.25 g

45-44: Potet: Høis 13 stk.

47-44: Rest 16 stk.

24/5-44: Potet fra Vennemølle 30 stk.

10/5-44: Rest 21 stk.

24/5-45: Potet: Øreby 20 stk.

7/6-47: Rest 8 stk.

Ind [not 60]
321-44: Materialt hændte af E. Mejins, der skriver:

"Totalsjæle 23 m. Læskjæle 13 m. Bækjæle 15 m.
Amor, 32 cm. 100 cm. Et meget småbel Væ. Stammen
muse nuget forhindert sig. Kommer nogle gange, men
ikke ret hid. Kons. meget lidt På, som hvert tilfælde
jævnt fordelt over Træet. ..... Træet var udend
Fødtvokser, mens med end stammen sat en del iuglyk
frem træer Vækst ..."

Skiilsj. Foto i Mejins Beskrivning 5.6.44.

31-44: 1.000 km. Vægt.: 98.4 g.

26-44: Podd i træet 12 Stk.

7-44: Alle i Læn.

24/5-44: Podd på 2 træmærker 29 Stk.

17-44: Rich 29 Stk.

31-47: De to Kast Snurting med disse planter da regnende.

321-47 (2.000 cm.) nærmere 9 cm. og 8 cm. med 20-22 cm. i

321-48 (2.000 cm.) 8 cm. nærmere 8 cm. ved 20-22 cm. i

Regner disse planter da mest i under i god ud
V704 (2)


24. 1. 45: Poket i bagpåb 20 sth.
47. 1. 47: Rest 14 sth.

Indført 1950
V. 710.  4 stk.
Køre Skor i Tøning.
Koldevariate D.

1942-44: Materialerne kendt af E. Skjærs, den skues:
  TV,胸部 81 cm, Kælvinge ....... lilleskælve 13,3 cm.
  Indf. 78 cm, Skamer i de ikke best set, men inden
  Fodsmer, Hæmmer velformet, jamfør sigende best
  med Bo. Træet stærk i en bevoksning med mange
  malde småt hede.
  1000 Røm vogn: 1000,0 g

43-44: Podde i Høis 12 stk.
49-44: Rekt 12 stk.
-44: 10

245-44: Podde for Blomstfruge 38 stk.
10/19-44: Rekt 32 stk.

Træet 45: Podde fra Blomstfruge 15 stk. (om produktion)
25/6-45: 20 stk. podde i deraf.
7/6-47: Rekt 15 stk.
V791

Act.

Drury Place, I Soro, Apr. 63 a

19/4/44: typed: Live

Indort 180
31. 7. 43.

Ask, "Friske"  
Lille Bøgeskov i. t. 82², Cpl. EK²  
Særlig med g. Cpl. 29. 8. 44.

245-44: Pokst på Vennumafde 34 Slik.  
170-44: Rent 24 Slik.

24. 45: Pendet i Langbyd. 20 Hr.  
7. 45: Rent 16 Hr.

Indført 80
V797

81 V997

Ark No. 1

Starening, Hornsher Bir.

24.3.44: Pønt i Hvis 13 stk.
3/4 - 44: Rødt 11 stk.

24.5.44: Rødt på enemote 36 stk.
19/6.44: Rødt 12 stk.

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No. 31 • 2008 In preparation
No. 32 • 2008 Not published yet
No. 33 • 2008 Not published yet
No. 34 • 2008 Identity verification of trees in the 61 year old common ash (Fraxinus excelsior) clonal seed orchard FP202