



EMPRESA BRASILEIRA DE PESQUISA AGROPECUÁRIA - EMBRAPA

Blocks 68 and 116 on Belterra estate, there are 77 families representing the 1941 crosses. Block 116 also has legitimate seedling families. The time of planting was from December 1941 to April 1942. The seedling families of the 1941 crosses are represented by not more than five to six families. Mr. Zilles gave each seedling family a general disease classification in early 1942. These Ford classifications are included with Mr. Zilles' resistance ratings, which are based on the Le Roy scale. Mr. Zilles made his classifications prior to seeing the results of the Ford scale, and for this reason can be considered as unbiased. In three months have elapsed since Mr. Zilles rated the families, his two classifications are in general agreement.

IV - Little or No Resistance Classification  
Ford Scale.

Description of Symptoms

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Outubro, 1942

The Resistance to South American Leaf Disease, of Seedling Families from the 1941 Program of Cross-pollinations on the Belterra and Fordlandia Estates of the Ford Company.

A systematic study of the disease resistance of seedling progenies resulting from the various programs of cross-pollinations conducted by Mr. Zilles, for the Ford company; was begun in October (1942).

In blocks 68 and 116 on Belterra estate, there are 77 seedling families representing the 1941 crosses. Block 116 also contains 14 illegitimate seedling families. The time of planting extended from December 1941 to April 1942. The seedling families of twelve crosses are represented by not more than five trees.

Mr. Zilles gave each seedling family a general disease classification in July 1942. These Ford classifications are included with the writer's resistance ratings, which are based on the Langford scale. The writer made his classifications prior to seeing those of Mr. Zilles, and for this reason can be considered as unbiased. Although three months have elapsed since Mr. Zilles rated the families, the two classifications are in general agreement.

The two scales classifying Resistance to South American Leaf Disease, are as follows;

1. The Ford Scale.

- Class I -- Many Resistant Seedlings.
- Class II - A Fair Percentage of Resistant Seedlings.
- Class III- Some Disease Resistance Indicated but few Outstanding Seedlings.
- Class IV - Little or No Resistance Class.

2. Langford Scale.

<u>Class°</u>	<u>Description of Symptoms.</u>
1	None (immune).
2	Yellowish or reddish flecks on leaves; little or no damage; no sporulation.
3	Lesions causing slight necrosis; usually little or no sporulation on young leaves.
4	Necrotic lesions causing distinct damage; some leaves may be slightly deformed.
5	Necrotic lesions; leaves reduced in size and



Langford Scale. cont'd.

<u>Class°</u>	<u>Description of Symptoms.</u>
6	Necrotic lesions; leaves dwarfed, deformed and/or ragged. Slight defoliation in some cases.
7	Moderate (5%-35%) defoliation.
8	Severe to complete defoliation.
9	Growing plant stem killed back (a new shoot may arise from a secondary bud).
10	Plant dead.

\* The class (from 1-8) into which a seedling or budded stump falls, should be determined by the condition of the most heavily infected flush of leaves.

One of the most striking features of these crosses is the extremely low level of resistance exhibited by crosses between Eastern clones. Among the best seedling families are those containing Av.183, PB-86, and Tj-1 with local resistant material; or the Benthamiana clones (F-4537 and F-4542) with Eastern material.

Eleven of the seedling families have been rated better than a 5 on the Langford scale. As many more fall in the 5-6 range. For this reason the writer is inclined to feel that he may not have been severe enough in his classification. Under artificial inoculations the number of definitely resistant families would likely be considerably reduced.

Another factor that must be considered in classifying seedling progenies, is the genetical variation within the family. For the most part, such variations will be minor.

The remainder of this report will be a series of descriptions of the various legitimate and illegitimate seedling families, in the order of their apparent resistance to South American Leaf Disease.

F-315 x Av.183

This is the largest seedling family from the 1941 crosses. A total of 1111 seeds of this cross were planted in December 1941 and January 1942, in 14 different locations in the block. Of this number, 1026 seedlings remain.

Growth is very vigorous and a great many of the seedlings show no signs of disease. Although leaves are often spotted reddish or brownish by the disease, there is evidence of light sporulation in but one or two instances. Leaves are sometimes deformed and a limited amount of defoliation occurs. One small seedling has a



stem lesion and another showed a light attack by Black Crust which had done little damage. This family is one of the most resistant in the 1941 crosses.

Ford scale I

Langford scale 3-4

F-4542 x F-2113

This is a vigorous seedling family. There is slight necrosis of some leaves accompanied by slight deformation. There is practically no defoliation. No evidence of any sporulation could be found. This is one of the better seedling families.

Ford scale I

Langford scale 3-4

F-4542 x Tj-1

The 167 seedlings of this family have made a fair growth. There is some slight necrosis and deformation of the leaves. Defoliation is slight. Most of the damage is confined to the lowest flushes of leaves. One tree has a stem lesion and three have suffered die-back.

Ford scale

Langford scale 3-4

F-4537 x Tj-1

In April 1942, 36 seeds of this cross were planted; 32 of these remain. The seedlings have a moderate rate of growth. Many are quite free from disease. A few have leaves showing small spots, but there is little leaf deformation and no evidence of sporulation. There is some light defoliation.

Ford scale I

Langford scale 3-4

B-3312 x Av.183

Of the original 99 seedlings planted in December 1941-February 1942, 89 seedlings remain. Most of the seedlings have shown vigorous growth. There is some slight leaf-fall which is confined to the lower flushes. Many seedlings are free from any sign of disease. At most, the leaves bear small reddish spots which in most cases do not cause lesions. Some leaf deformation was noted. There is no sign of sporulation. The family appears to be disease resistant.

Ford scale II

Langford scale 3-4

F-211 x Av.183

There are 19 seedlings in this family. They were planted in February 1942. Growth is rather good. Lesions usually cause slight necrosis and damage. Some deformation also occurs. No evidence of any sporulation could be found. A slight amount of



defoliation is found among the lower flushes of leaves. A single seedling has a leaf bearing a small spot of Black Crust.

Ford scale II

Langford scale 3-4

B-37 x F-374

The growth of these three trees has been irregular. Disease has caused a few small spots on the leaves but there is no sporulation. Deformation of the leaves is slight. Very little defoliation.

Ford scale I

Langford scale 3-4

B-54 x Av.256

The three seeds planted in March 1942 are all alive. The growth of two of them is vigorous, but one has died back. The reason for this die-back could not be determined. There is some slight spotting and deformation of the leaves by disease. No evidence of sporulation was found. Defoliation is slight.

Ford scale II

Langford scale 3-4

PB-86 x B-106

From January-March 1942, the six seedlings of this family were planted. Four seedlings. Growth is very vigorous. Although some spotting and slight deformation occurs, there is little damage to the leaves. Leaf-fall is light.

Ford scale I

Langford scale 3-4

F-4537 x Av.183

There are 114 seedlings of this cross which were planted in April 1942. Their growth is even. There are some lesions causing slight necrosis and deformation of the leaves, but these are not serious enough to cause defoliation. General defoliation is very limited. This is one of the more promising looking families.

Ford scale I

Langford scale 4

B-30 x PB-86

Sixteen of the eighteen seedlings planted in April 1942, remain. There is a fairly good even growth. In some cases the leaves have necrotic lesions causing slight damage and some deformation. There is no sign of any sporulation. Among the lower flushes of leaves there is moderate defoliation.

Ford scale II

Langford scale 4-5

B-79 x PB-86

Forty-one of the original forty-three trees remain. The seeds



were planted in April 1942 and the growth has been good. Some leaves are spotted and sometimes heavily deformed by leaf-disease. There is some evidence of sporulation. There is minor defoliation. One of the seedlings has been spotted by Black Crust.

Ford scale II

Langford scale 5-6

PB-86 x B-110

Forty-nine of the original fifty trees of this progeny remain. Growth is moderately vigorous. Many of the leaves are spotted and slightly deformed by disease. In two instances some sporulation was evident. There is moderate leaf-fall. The later flushes of leaves have been relatively free from the disease.

Ford scale I.

Langford scale 5-6

PB-86-x-F-176

This family was planted during February-March 1942, and the original 37 trees still remain. The growth rate is exceedingly variable within this progeny but is not too vigorous. Although many leaves show spotting and lesions causing slight necrosis, there is no evidence of sporulation. Leaves are sometimes deformed and moderate leaf-fall occurs.

Ford scale

Langford scale 5-6

PB-86 x B-30

Of the original 141 trees planted from Jan-March 1942, 116 now remain. The family has a fairly good, even growth. Although most of the seedlings show spotting and some leaf deformation, there is evidence of light sporulation on only a few seedlings. A few stem lesions were noted. There is a slight amount of defoliation which usually is restricted to one or two of the three leaflets.

Ford scale III

Langford scale 5-6

PB-86 x B-37

There are 267 trees in this family. Planting was from January-March 1942. This progeny shows a great amount of variation in growth. Defoliation is light, being confined to the lowest flushes of leaves. The leaves of some seedlings are marked by necrotic lesions and some deformation. No signs of any sporulation could be found. In a few cases die-back was noted, but the cause could not be determined.

Ford scale II

Langford scale 5-6

B-87 x Tj-1

Six seedlings represent this family. Growth is rather poor. There is some spotting and slight deformation of the leaves by disease. No evidence of sporulation was seen. A very moderate amount of defoliation occurs.



Ford scale III

Langford scale 5-6

B-37 x Av.256

Five of the original eleven seedlings remain. Planting took place in March 1942. The growth has been fair. The seedlings have a good appearance, in general. There is a small amount of defoliation. Some spotting and deformation of the leaves occurs. No evidence of sporulation was noted.

Ford scale II

Langford scale 5-6

F-176 x Av.183

In Jan-Feb. 1942, 184 seeds of this cross were planted. 162 seedlings now remain. The growth is fairly good. Very slight defoliation in most instances. One small seedling bears a large stem lesion. Although some of the seedlings are apparently free from the disease, others show considerable localized spotting and deformation. This leaf deformation does not affect the entire leaf. Some sporulation is evident.

Ford scale II

Langford scale 5-6

F-176 x PB-86

The five members of this family were planted in April 1942. Moderate growth rate. The leaves are spotted and slightly deformed by leaf disease. Some sporulation was noted. Defoliation is light.

Ford scale II

Langford scale 5-6

B-45 x Tj-1

In April 1942 the three seedlings of this cross were planted. Growth is irregular. Leaves are spotted by the disease and there is apparently a slight amount of sporulation. Defoliation is moderate.

Ford scale III

Langford scale 5-6

B3263 x Av.183

This progeny consists of 64 seedlings of greatly varying growth rates. The seeds were planted from Dec. 1941 to Feb. 1942. Some trees have leaves spotted and deformed by the disease, and exhibit sporulation. Two trees have large stem lesions. Other seedlings are fairly clean; showing some spotting and slight deformation but no sporulation. Leaf-fall is light.

Ford scale IV

Langford scale 6

PB-86 x F-6523

This family was planted from March-April 1942, and is represented by 20 of the original 28 trees. Growth has been fairly vigorous.



The leaves are often spotted and deformed by disease, but there is very little evidence of sporulation. Some trees had leaves spotted by Black Crust. Slight defoliation.

Ford scale II

Langford scale 6

B-37 x Tj-1

There are now 18 of the original 45 trees planted in March-April 1942. Growth is fair. Some leaves have lesions causing slight necrosis and damage. Some slight deformation occurs but only one tree shows light sporulation. Moderate defoliation.

Ford scale II

Langford scale 6

F-409 x Av.183

There are now 310 of the 340 seedlings planted from Jan-March 1942. There is considerable variation in growth. Most of the seedlings show some effect of leaf disease but no sporulation was found. Necrotic lesions cause considerable damage. There is much leaf deformation and moderate defoliation. Several trees were noted to have been attacked by Black Crust but no serious damage resulted.

Ford scale II

Langford scale 6-7

F-1619 x Av.183

*Ex 7761*

This is the second largest seedling family from the 1941 crosses. 535 seeds were planted from Feb-April 1942, and 433 seedlings now remain. The family exhibits a great variation in growth rate. Some of the seedlings have good growth; are but little spotted and deformed by disease, and show very light defoliation. Others have poor growth and exhibit spotting and deformation of leaves, accompanied by moderate leaf-fall. Some slight sporulation was noted. A few seedlings have died-back. In several instances stem lesions were found.

Ford scale II

Langford scale 6-7

B-39 x PB-49

This seedling family is now represented by 42 trees, which were planted during March-April 1942. Growth has been somewhat irregular. There is some spotting and deformation of the leaves accompanied by moderate defoliation. There is also light sporulation in a few instances.

Ford scale III

Langford scale 6-7

F-374 x Av.183

The 32 trees remaining in this family were planted from Dec.1941 to Feb. 1942. Growth varies considerably. Leaves are marked and deformed by disease. In some instances, sporulation was noted. Rather severe defoliation occurs.



Ford scale III

Langford scale 6-7

PB-86 x B-45

Only two of the 41 seedlings which were planted in Feb-March 1942, have been lost. Growth is fair. The leaves are often spotted and somewhat deformed by disease. Sporulation is evident. There is moderate defoliation. Two stem lesions were seen.

Ford scale III

Langford scale 6-7

B-67 x Tj-16

In March-April 1942, 25 seeds of this cross were planted; of these 20 remain. Growth is poor. There is moderate defoliation of most seedlings. One seedling suffers from a stem lesion. Some of the trees are rather clean; showing only slight spotting and deformation of the leaves, and no sporulation. In others, the leaves bear necrotic lesions and are more severely deformed. Evidence of light sporulation was found.

Ford scale III

Langford scale 6-7

B-54 x Tj-1

The nine representatives of this cross were planted in April 1942. The growth is fairly good. Several new flushes of leaves have been heavily hit by disease and are much deformed. On older flushes some of the leaves bear necrotic lesions and are deformed. Some slight sporulation seems evident. Defoliation is moderate.

Ford scale II

Langford scale 6-7

B-67 x F-374

The ten trees of this family were planted in March 1942. There is a great amount of variation in growth. There is some spotting of the leaves and in some instances extensive deformation. No sporulation was found. Defoliation is moderate.

Ford scale II

Langford scale 6-7

B-67 x Av.256

During March-April 1942, the number (10) of the seeds of this cross were planted. Growth has been fairly good except where seedlings have suffered die-back. Damage to the leaves is caused by necrotic lesions, and some deformation occurs. There is no evidence of any sporulation. Minor defoliation is found.

Ford scale II

Langford scale 6-7

Av.256 x F-6523

In March 1942, the 17 seedlings of this family were planted. The rate of growth is slow. The leaves are spotted and deformed by disease and some sporulation was found. Some of the new flushes of leaves have been deformed. There is minor leaf-fall. Several



seedlings have been attacked by Black Crust.

Ford scale III

Langford scale 6-7

PB-86 x F-212

Thirteen trees represent this family. They were planted in Feb. 1942. Growth of the seedlings has been fair. Some leaves are heavily spotted and damaged by the disease and are deformed. No evidence of sporulation was found. Defoliation is moderate.

Ford scale I

Langford scale 6-7

B-37 x PB-86

The six trees of this seedling progeny were planted in April 1942. The leaves are much spotted and deformed by disease. There is evidence of sporulation. Defoliation is moderate.

Ford scale III

Langford scale 6-7

B-55 x Av.256

There are three trees representing this seedling family. Growth is spindling. Many leaves are spotted and deformed by disease. There is moderate defoliation. No sporulation was noted.

Ford scale III

Langford scale 6-7

B-39 x Pilm.A-44

This family consists of five seedlings which were planted in April 1942. Growth is fair. Seedlings of this cross have been attacked by leaf disease and Black Crust. Leaf disease has caused necrotic lesions and deformation. There is evidence of sporulation. Defoliation is moderate.

Ford scale II

Langford scale 6-7

B-67 x Tj-1

There is but one tree of this cross. It's growth is poor. The leaves are spotted and deformed. No evidence of sporulation. Defoliation is moderate.

Ford scale III

Langford scale 6-7

B-54 x PB-86

There are 30 seedlings in this progeny. They were planted during March-April 1942. Growth has not been good. There is much spotting and deformation, as well as dwarfing of leaves. Defoliation is fairly severe. No evidence of sporulation was found.

Ford scale II

Langford scale 7

PB-86 x B-39

There are nineteen seedlings in this family, which were planted March 1942. Growth has been poor. The leaves have



necrotic lesions and are much deformed. There is moderate leaf-fall. No evidence of sporulation was found. One seedling has a large stem lesion.

Ford scale II

Langford scale 7

Av.256 x F-176

This seedling progeny of eleven trees was planted in March 1942. Growth is poor. Some leaves show slight deformation and some sporulation caused by disease. Leaf-fall is moderate.

Ford scale III

Langford scale 7

PB-86 x B-67

There are 37 trees of this cross. They were planted during Feb. 1942. Growth has been fairly good and uniform. There is some spotting and deformation of the leaves by disease. In some instances sporulation was noted. Some stem lesions were found. Defoliation is moderate.

Ford scale II

Langford scale 7

Av.256 x B-32

There are 17 seedlings in this family which was planted in March-April 1942. The growth has been slow. Many stem lesions were noted. There is moderate defoliation. The leaves show but little spotting and deformation by disease. There is no evidence of sporulation.

Ford scale IV

Langford scale 7

Av.256 x Pilm.A-44

Two of the original seedlings remain. Growth has been very poor. The leaves have necrotic lesions which have carried away portions of the leaves. There is also some deformation. Defoliation is rather heavy.

Ford scale IV

Langford scale 7

B-39 x Tj-1

Two of the four seedlings planted in April 1942, now remain. Growth is rather poor. The leaves bear lesions and are deformed by disease. Some evidence of sporulation. One young flush of leaves has been heavily attacked. One of the trees has a stem lesion. Defoliation is moderate.

Ford scale II

Langford scale 7

PB-86 x PB-49

From Jan-March 1942, 185 seeds of this cross were planted. At present, 134 trees remain. Growth has been poor. Necrotic lesions



have caused distinct damage and deformation of the leaves, but no sign of sporulation was seen. A few seedlings bore stem lesions. There is moderate defoliation.

Ford scale IV

Langford scale 7-8

B-3395 x Tj-1

In Feb. March 1942, 16 seeds of this family were planted, and at the present time 12 seedlings remain. The trees have a poor spindling growth. There has been some die-back. There is spotting of the leaves but no deformation or evidence of sporulation. Leaf-fall is moderate.

Ford scale IV

Langford scale 7-8

F-6520 x Tj-1

At present there remain 84 seedlings planted in April 1942. Growth is variable and spindling. Many leaves are heavily spotted by disease and there is some evidence of deformation. Heavy sporulation was noted. There is moderate defoliation. Four of the trees have died-back.

Ford scale IV

Langford scale 7-8

B-14 x PB-86

This family of 14 seedlings was planted in April 1942. One plant bears a stem lesions. Some leaves are marked by disease and are slightly deformed. Slight sporulation was found. Defoliation is fairly heavy. Two trees have died-back.

Ford scale III

Langford scale 7-8

B-30 x Pilm.A-44

This progeny was planted in April 1942 and is now represented by 15 trees. Growth is rather poor; one seedling having died-back. There is severe defoliation in many instances. A few of the trees are fairly clean and have only slight spotting and deformation caused by the disease. Other trees exhibit heavier leaf spotting and deformation accompanied by heavy sporulation.

Ford scale III

Langford scale 7-8

F-3160 x Tj-1

The 31 trees of this family were planted in Feb-March 1942. Growth is good but slender. There is leaf spotting and deformation accompanied by fairly severe leaf-fall. Some of the seedlings show heavy sporulation. One stem lesion was noted.

Ford scale IV

Langford scale 7-8

F-6520 x Tj-1

There are 17 seedlings in this progeny. Growth is very poor.



The leaves have suffered severe necrosis and are ragged and deformed. Sporulation was fairly heavy. Moderate defoliation occurs.

Ford scale

Langford scale 7-8

B-55 x Pilm. A-44

This family is represented by 33 seedlings. Planting took place in April 1942. Growth has been poor. The leaves of most trees show spotting, deformation, and some sporulation. There is much premature leaf-fall. There are many stem lesions caused by the disease, and many of the seedlings have died-back.

Ford scale III

Langford scale 8-9

PB-86 x Pilm.A-44

There are 81 seedlings in this family. Planting took place during Feb-April 1942. Growth is generally poor and there is considerable die-back. Leaves are much spotted and deformed. Others are dwarfed. Sporulation is evident. There is extensive defoliation. Stem lesions were seen.

Ford scale IV

Langford scale 8-9

Av.256 x Tj-1

Now, 101 of the original 140 seedlings planted from Feb-April 1942, remain. This family exhibits poor growth. There is considerable die-back among the seedlings, and rather severe defoliation. Leaf growth is often stunted. Although there is some spotting of the leaves and slight deformation, there is no evidence of sporulation.

Ford scale IV

Langford scale 8-9

B-55 x PB-86

The 20 seedlings representing this family were planted in April 1942. Their growth is poor and there is much die-back. Many of the seedlings possess large stem lesions. Leaves are spotted and deformed. Sporulation occurs. There is rather severe defoliation.

Ford scale III

Langford scale 8-9

PB-86 x Av.256

149 of the original 191 seedlings remain. Planting took place from Jan-March 1942. Growth is exceedingly poor. Nearly half of the trees have died-back, sometimes more than once. In some cases stem lesions were found. Leaves sometimes spotted and deformed, and show slight sporulation. There is severe defoliation in many instances.



Ford scale IV

Langford scale 8-9

PB-86 x F-374

This family of 74 trees was planted during Feb-March 1942. The appearance is generally poor. Many seedlings show some die-back. Some have large stem lesions. There are necrotic lesions and leaf deformation accompanied by defoliation.

Ford scale III

Langford scale 8-9

B-55 x Tj-1

There are 22 seedlings in this family. Growth is fairly good. Eight trees have suffered die-back. Slight spotting and deformation of the leaves occurs, but there is no sign of sporulation. Moderate defoliation.

Ford scale

Langford scale 8-9

PB-86 x Tj-16

During Feb. 1942, 164 trees of this cross were planted and at the present time 111 of them remain. Growth has been very poor. Many trees have died-back. Leaves bear necrotic lesions and are deformed. There is some evidence of sporulation. Many stem lesions were found. Defoliation is severe.

Ford scale IV

Langford scale 8-9

Av.256 x Tj-16

There remains 42 of the 77 seedlings planted during March-April 1942. Growth is poor. Defoliation is severe. On the few leaves remaining, there is little evidence of disease. Stem lesions were noted.

Ford scale IV

Langford scale 8-9

Tj-1 x PB-86

Of the original 307 seeds planted in Feb-March 1942, only 158 remain. The growth of this family has been very poor. There is excessive die-back among the remaining seedlings. Many stem lesions were noted. Leaves are spotted and sometimes deformed by disease. Several seedlings had heavy sporulation on a few leaves. Severe defoliation is common.

Ford scale IV

Langford scale 8-9

F-366 x Av.183

In Feb-March 1942, 121 seeds of this family were planted. At present, 103 of these remain. Growth is poor and there is some die-back. Many stem lesions were noted. There is spotting and deformation of the leaves, and considerable sporulation. There is moderate to severe defoliation.



Ford scale IV

Langford scale 8-9

Tj-1 x Av.256

Seeds of this family were planted in March 1942, and 28 seedlings remain. Growth is very poor with much die-back in evidence. Some of the seedlings bear stem lesions. There is moderate defoliation. Some leaves are spotted by the disease but no sporulation was seen.

Ford scale IV

Langford scale 8-9

B-55 x PB-49

Of the original 38 seedlings planted in April 1942, 36 remain. Growth is not good and some seedlings exhibit die-back. Moderate defoliation. Leaves spotted and bear necrotic lesions, but there is little deformation. Sporulation was noted.

Ford scale IV

Langford scale 8-9

B-54 x Pilm.A-44

The 21 trees representing this family were planted in April 1942. Growth is fairly good but four of the seedlings have died-back. Leaves are spotted and deformed by the disease, and in a few cases sporulation was noted. Moderate to heavy defoliation.

Ford scale II

Langford scale 8-9

Av.256 x PB-49

Planted in Feb-March 1942, this family is now represented by 135 seedlings of very poor growth. Many seedlings have died and others exhibit die-back. Some trees are completely defoliated and most retain only leaves of the latest flush. Some seedlings have stem lesions. In some instances sporulation occurs.

Ford scale IV

Langford scale 8-9

F-1023 x Av.183

The 37 trees of this cross were planted in February 1942. Growth is poor. Some of the seedlings have died-back. Many leaves are heavily spotted and deformed by disease, but no evidence of sporulation could be found. Defoliation is rather severe.

Ford scale IV

Langford scale 8-9

B-74 x Pilm.A-44

This family of 11 trees exhibits a great variation in the rate of growth. Three seedlings have suffered complete defoliation and others show rather severe defoliation. In some cases the leaves are slightly spotted and deformed by disease, but no



sporulation occurs. One seedling has two stem lesions.

Ford scale II

Langford scale 8-9

AV.256 x PB-86

There are 160 of the original 201 seedlings, remaining. These were planted from Feb-April 1942. Growth is very bad and many seedlings have suffered die-back. There are many stem lesions. Severe defoliation is general. Leaves appear dwarfed but little spotting or deformation occurs. There is no evidence of sporulation. It is quite likely that the extensive defoliation prevents one from finding evidence of any sporulation.

Ford scale IV

Langford scale 8-9

B-79 x Pilm.A-44

There are 19 seedlings in this family which was planted in April 1942. Severe defoliation does not often occur, usually being moderate. Seven trees have died-back. Some spotting and deformation of the leaves. Slight evidence of sporulation.

Ford scale

Langford scale 8-9

B-30 x PB-49

Six seedlings planted in April 1942 remain. Growth is fair. One of the seedlings has been completely defoliated. Another has somewhat leaves which are spotted and deformed by disease. Some sporulation was noted.

Ford scale III

Langford scale 8-9

PB-86 x B-79

In March 1942 the five seeds of this cross were planted; one of which is now completely defoliated and almost dead. Growth of the remaining trees is only fair. Leaves are somewhat spotted and deformed. Defoliation is moderate. One of the seedlings has a stem lesion.

Ford scale III

Langford scale 8-9

F-3430 x Tj-16

Only 290 of the original 398 seedlings of the family remain. Planting was done in Feb-April 1942. Growth has been very poor. Many of the seedlings have die-back and others are completely defoliated. In general, leaf-fall is severe. Many stem lesions were noted. Although most trees have only leaves of the newest flush remaining, some evidence of sporulation was found. There is spotting and deformation of the leaves.



Ford scale IV

Langford scale 9

F-374 x Tj-16

The five trees of this cross were planted in February 1942. Growth of the seedlings has been poor, and all of them show die-back. Two seedlings also bear stem lesions. Some of the leaves are marked by lesions causing slight necrosis but no deformation or evidence of sporulation was found. Defoliation is moderate.

Ford scale IV

Langford scale 9

PB-86 x Tj-1

This family has 174 of the original 307 seedlings remaining. Planting was from Feb-April 1942. Growth is very poor. Some seedlings are entirely defoliated by the disease, and many show die-back. Many stem lesions were noted. Leaves remaining are deformed and dwarfed. Many show light to heavy sporulation. It is expected that before very long this family will die out completely.

Ford scale IV

Langford scale 9-10

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Illegitimate Seedling Families Planted in Block 116

B-44

The 28 trees of this family have an even growth. There is some slight spotting of the leaves but no deformation or evidence of sporulation. Defoliation is very light. Apparently this family has considerable natural resistance.

B-79

This large family has the best growth of any of the illegitimate seedling families. In some cases leaves are spotted and deformed by disease. There is also evidence of sporulation. Defoliation is minor.

B-27

The 65 seedlings of this illegitimate family were planted during March-April 1942. Growth is fairly good. There is some spotting and slight deformation of the leaves by disease. No sporulation was noted. Two seedlings have stem lesions.



B-49

There are eight seedlings in this family. Some new flushes of leaves have been heavily hit by disease. There is spotting and deformation of leaves on older flushes, but no evidence of sporulation. Leaf-fall is slight except on the new flushes.

B-54

The eleven seedlings of this family have an irregular growth. Spotting and deformation of leaves occurs but there is no sign of sporulation by the disease. A moderate amount of defoliation.

B-67

Poor growth characterizes this family of 19 trees. Some spotting and deformation of the leaves occurs.

B-37

Seventy of the 92 seedlings remain. Growth is rather poor and some trees suffer from die-back. There is moderate defoliation. Some leaves are spotted and deformed but show no evidence of any sporulation.

B-41

This is a large seedling family. Growth is fair. Some trees have died-back. Considerable necrosis and deformation of the leaves accompanied by sporulation. Moderate defoliation.

B-96

This large family has a fairly good growth. Heavy spotting and deformation of the leaves is found. No sign of sporulation. Moderate defoliation.

B-55

The 24 members of this family have given a poor growth. Considerable damage to the leaves has been caused by necrotic lesions and deformation. No evidence of sporulation.

B-39

The 17 seedlings of this family exhibit a very poor growth. Spotting and deformation of leaves is accompanied by moderate defoliation.

B-70

Many seedlings have died. Growth of the remaining 23 is irregular. Leaves are spotted and deformed. Moderate defoliation.

B-78

Both seedlings have died.



F-211

The three seedlings are dead.

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(a.) Lawrence A. Beery Jr.  
Agent.

Nov. 4, 42  
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