**The Comparative Value of NPK Combination Alone, of Different Cover Crops Alone, and of Fertilizer Plus Cover Crops on the Growth and Yield of Yellow Transparent Apple Trees and Belle of Georgia Peach Trees:**

No work done. Project completed.

**F. S. Lagassé.**

## DEPARTMENT OF PLANT PATHOLOGY

**The Dissemination of Yellows and Little Peach:**

Studies on the masking of Yellows and Little Peach in Prunus species other than the peach (see last Annual Report, Bul. 179) indicate that plums may be the hosts in which these diseases are hiding and from which the vector, a leaf hopper[1] (*Macropsis trimaculata*) is disseminating pathogenic viruses to the peach orchards. An extensive survey made this season in Delaware, and in several adjacent states, shows this leaf hopper lives primarily on the plum; we have found it most abundant on the Japanese varieties (*P. salicina*) such as the variety Abundance, or crosses of Japanese plums with *P. domestica, P. americana,* and *P. munsoniana.* It is found very sparingly on the peach, and when found there, as a rule the peach trees are in sod ground or in poorly fertilized and neglected orchards.

We have suspected for several years that certain plum varieties may mask the symptoms of Yellows and Little Peach to such an extent that infection may not be very evident. Work in the past two years in budding Yellows and Little Peach into various plums, shows that the Japanese variety known as Abundance (*P. salicina*) may carry the viruses of both of these diseases without showing any marked symptoms of either disease. We have successfully budded peach Yellows into Japanese plums, and by budding the plum stock back into peach shown that the plum was carrying the virus. Erwin F. Smith makes the statement[2] "Yellows is a disease of peaches, nectarines, almonds, and apricots. It does not occur in plums." The fact that the Oriental plums seem to live much longer than the European or American plum (see Table I) may be a factor in the dissemination of these viruses.

A study of the dying of plums in the experiment station variety orchard shows many affected with Little Plum and also several with what appears to be Yellows. These observations are being checked by budding all the varieties of plums now growing in the experiment station orchard into peaches to learn how many of these plums are actually carrying Little Peach and Yellows.

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Note: Dr. Lagassé was on leave for the greater portion of the fiscal year. (Director)

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[1]Kunkel, L. O.— Insect Transmission of Peach Yellows Contribution from Boyce Thompson Institute, Vol. 5, No. 1-1933.

[2]Smith, E. F.—Peach Yellows, a Preliminary Report, U. S. Dept. Agric., Botanical Division, Bul. No. 9-1888.

The following table shows the number of plum and peach trees that are now living or dead, which were planted in the experiment station variety orchard in 1908.

**Table 5—Showing the Varietal Source of Plum* Planted in the Variety Plum Orchard in 1908, the Number Now Living and the Number Dead.**

| Varietal Source | Number planted | Number living | Number dead | Per cent living |
|---|---|---|---|---|
| P. domestica | 49 | 30 | 19 | 61.2 |
| P. insititia | 2 | 2 | 0 | 100.0 |
| P. munsoniana | 14 | 8 | 6 | 57.7 |
| P. americana | 4 | 1 | 3 | 25.0 |
| P. salicina | 25 | 22 | 3 | 88.0 |
| P. simonii | 2 | 2 | 0 | 100.0 |
| P. salicina X simonii | 6 | 6 | 0 | 100.0 |
| P. salicina X munsoniana | 10 | 6 | 4 | 60.0 |
| Peach (P. persica) | 21 | 0 | 21 | 0.0 |

*Data furnished by the Department of Horticulture.

It is very evident in the above table that the peach fared much worse than the plums, many having died in 16 years and all having died in less than twenty-four years. The European plums of the *P. domestica* group had only 61.2 per cent living after 24 years; the American group (*P. americana*) 25 per cent and (*P. munsoniana*) 57.7 per cent respectively, whereas the Chinese group (*P. simonii*) showed 100 per cent and the Japanese group of *P. salicina* X *P. simonii*) showed 100 per cent living.

It is quite probable that the plums are the hosts which have brought in the viruses of Little Peach and Yellows into America, coming in on the Oriental plum varieties. This conclusion may be warranted from the fact that Little Peach and Yellows have never been reported in Europe and also there is much evidence that these diseases were not in our introduced Prunus species for a century or more after settling this country and that they started in the vicinity of Philadelphia; further the fact that the leaf hopper (*Macropsis trimaculata*) shows a preference for the Japanese plums might indicate its introduction on this host. We have, however, found this hopper on all the rough bark plums in Delaware as well as in the several adjacent states.

If *Macropsis trimaculata* is the sole disseminator of these diseases, our survey would indicate that the plum is the favorite host of the insect and control of this disease must start with control of the hopper on the plum, or else the elimination of plum in and adjacent to peach orchards. We have laid out extensive experiments on *M. trimaculata*

on both Little Peach and Yellows. Several thousand hoppers have been fed on both seedlings and old peach trees after feeding the same on virus-infected trees.

The *Periodical Cicada*. Well planned experiments the past season have thus far shown no evidence that the 17-year Cicada is a factor in the dissemination of Yellows or Little Peach. However, it is too early to draw conclusions on this work.

**T. F. Manns.**

**The Control of Tomato Seedling Diseases:**

Again in cooperation with Prof. VanHaltern of Georgia, (1933) we have made three plantings of tomato seedlings from plants variously treated in seed bed work in Georgia. Table 6 shows the source of the seed and the several treatments given the different plots by Prof. VanHaltern, together with data on diseases showing in Delaware.

**Table 6—Showing Source of Seed and Treatments Given Tomato Seed Beds in Georgia with Amount of Disease Showing in Delaware.**

**Marglobe Variety—Clean Seed**

| Plot No. | Seed and Plant Treatments | Diseases Shown in Delaware |
|---|---|---|
| 1 | Seed treated with Semesan Jr. Plants sprayed 5 times with 3-5-50 Bordeaux. | Trace of early blight (*Macrosporium solani*)—1 rugose mosaic plant in 150. |
| 2 | Seed treated with Semesan Jr. Plants not sprayed. | Trace of early blight—3 rugose mosaic plants in 150. |
| 3 | Seed not treated. Plants sprayed 5 times with 3-5-50 Bordeaux. | Trace of early blight. |
| 4 | Seed not treated. Plants not sprayed. | Trace of early blight. |
| | **Marglobe Variety—Commrecial Seed** | |
| 5 | Seed treated with Semesan Jr. Plants sprayed 5 times with 3-5-50 Bordeaux. | Trace of early blight—2 Rugose mosaic plants in 150. |
| 6 | Seed treated with Semesan Jr. Plants not sprayed. | Trace of early blight. |
| 7 | Seed not treated. Plants sprayed 5 times with 3-5-50 Bordeaux. | Trace of early blight. |
| 8 | Seed not treated. Plants not sprayed. | Trace of early blight. |

The trace of early blight (*Macrosporium solani*) was not evident upon plants at time of planting.