

Comparison of commercial elm varieties and promising new Dutch clones for resistance to DED in a field test

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Abstract:

Since the early 20th century, elm breeding for resistance to DED has resulted in the release of several more or less resistant varieties to the European market. Especially in the Netherlands and the USA large and long-term research- and selection programs were running resulting in a number of hybrid clones with moderate till very good resistance. Also more recently, in Italy and France several new varieties with good resistance have been released. Today a wide range of clones of different DED resistance and different parentage is available on the market. However, the use of these new elm varieties in the Netherlands is still limited. Apparently the lasting problems with DED in old varieties has led to a lack of confidence in the resistance of these newly released varieties among managers of landscape and urban green.

In order to compare the level of DED resistance of elm varieties recently introduced into the Netherlands a field test was established. The field test comprised of 18 varieties, one species and 10 selections from the Dutch Alterra breeding program. Varieties included were those developed in the USA and not yet tested under Dutch conditions, Dutch varieties and two references with known DED response (Commelin and Lobel). Two-year old plants derived from cuttings or graftings were planted in the field according to a complete randomised block design (9 blocks, 4 plants per clone per block). In total four inoculation treatments with *Ophiostoma novo-ulmi* were carried out in two consecutive years (9 plants per clone per treatment). Symptoms such as disease index, defoliation and crown dieback were assessed after 4 weeks, 8 weeks and one year after inoculation and were statistically analysed using Monte Carlo tests.

The severe inoculation method used enabled us to demonstrate clear differences in resistance level between the varieties, ranging from highly resistant to very susceptible. Additionally, it showed that the varieties differed in recovery ability. Especially, the varieties with a good resistance from the American DED research program recovered well after initially showing clear disease symptoms. The ranking of varieties for level of DED resistance confirms, with a few exceptions, earlier published resistance levels and experience from plantings in the Netherlands. It was concluded that an ample number of varieties with good resistance is available. The Alterra selections performed well compared to the released varieties and give good opportunities to further broaden the current range of varieties on the Dutch market.

Keywords: DED resistance, Elm varieties, Ulmus, inoculation test, *Ophiostoma novo-ulmi*.