Interesting research projects on perennials in The Netherlands

Influence of climate-change on our perennials

Our climate is changing, there is no doubt about that. Temperate area's in Europe and The United States are getting warmer. In Western Europe (e.g. The Netherlands) winters will be wetter, and there will be periods of extreme drought, rainfall or heat more often. This influences plant growth, both of natural vegetation and of cultivated plants used in gardens and parks. This also has consequences for the nursery- and perennial industry.
For the Dutch Nursery industry the Applied Plant Research of Wageningen UR has done research on the consequences of climate change on our nursery- and perennial assortment. The consequences are quit big. Some interesting practical aspects are:

- By research of old literature and catalogues and interviewing nurserymen and arboreta it appeared that nowadays much milder plant species are grown in The Netherlands than 50 years ago. Many common species like *Acanthus mollis*, *Alcea rosea*, *Asphodeline lutea* and *Cortaderia selloana* are grown at a large scale now. They were risky to grow in earlier days.
- The product range of (perennial) plant suitable for the Dutch (& West European) climate has been expanded and will be expanded more in the next decennia. More and more southern and Mediterranean species can be grown without protection.
- USDA-hardiness maps of USA and Europe, often used for indication of hardiness of plant species, have been changed. There is a shift of half a zone in 30 years and will be another half zone in the next 30 years (e.g. USDA zone 7a > 7b > 8a; see http://planthardiness.ars.usda.gov).
- The coming decades some species will get insufficient cold to go into winter rest or to come out of it. This gives some limitations of the product range. Because of the complex physiological background it is difficult to make predictions.
- The urban environment is warmer than the surrounding countryside. Especially in centres of large cities milder (perennial) species can grow. More and more southern species occur spontaneously in pavements or firebreaks (e.g. *Nepeta racemosa* and *Cymbalaria muralis*).
- We also have be careful with planting milder species, because of the permanent risk of occasional low temperatures in winter (e.g. winter 2011-2012).
- With cheap and easily replaceable species such as perennials and small shrubs you can take more risks than with expensive long-lived trees.
- Dutch summers will get drier. Drought resistant species will benefit. In the urban environment drought resistant species in are the advantage anyway, because of the pavement (where a lot of water is drained).
- The Dutch winters will get wetter. Species that dislike wetness have disadvantage in wintertime (e.g. *Thymus*, *Lavandula*, *Caryopteris*, and *Helianthemum*).
- Extreme weather circumstances will occur more often (e.g. drought, downpours, storm, temperature fluctuations, etc.). Strong and robust species are in favour and species that ask for strict specific circumstances (e.g. moisture requirements), are at a disadvantage.
- Spread the risks in terms of use of plant species. By extreme weather conditions and new diseases and pests damages are quit unpredictable. Use of too much the same species or cultivars is risky. The more species variation in a planting, the more stable the system as a whole regarding resistance to diseases and pests.
- Variety trials are of extra importance to test species and varieties in our changing climate.

Literature for more information (in Dutch):
M.H.A Hoffman (2012): *Klimaatverandering en sortiment* – Dendroflora 48, p. 4-33



Left: Many southern species like *Cymbalaria muralis* spontaneously grow in the Dutch urban environment
Middle: Species like *Cortaderia selloana* and *Alcea rosea* can survive the Dutch winters nowadays
Right: The city climate is drier and hotter compared to the countryside

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