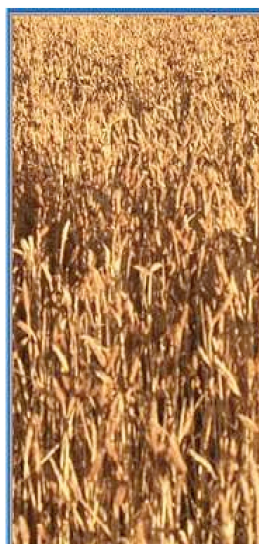


Digital newsletter about silicon and other beneficial nutrients

## Nanotech on farmers' fields

Farmers are nano-workers *pur sang*. Their fields are reservoirs of natural nanomaterials. When spreading manure, they add still more of these tiny bits to the soil. Recently researchers start to explore applications of manufactured nanoparticles on farmers' fields.

Clay minerals, humic acids and metal oxides and hydroxides - every walker has countless natural nanoparticles under his feet. And so do farmers and growers when they go through their crops. Unwittingly they work with all kinds of nano-materials, although only a small proportion of these nanoparticles occur as discrete entities. Organic colloids for instance are largely associated with their inorganic counterparts, or form coatings over mineral surfaces. Recently researchers explore the aspects of manufactured nanoparticles on farmers' fields. The use of nano fertilisers or nano pesticides however is still in its infancy. Just like other developments, nano-agriculture has advocates and opponents as well. In this lustrum issue both voices get a chance. With this issue a dossier about particle size of fertilisers goes ahead.



### Inventory of Agrifood Nanotechnology

- Open Individual Records
- Exit Nanotechnology Inventory

#### Reports

- Nanotechnology Funding
- Nanotechnology Risks and Benefits
- Nanotechnology Sectors and Research Areas
- Nanotechnology Topics and Techniques
- Nanotechnology Toxicology and Endpoints
- Time to Commercialization

*A new variety of canola oil contains tiny materials that can block cholesterol from entering the bloodstream. Just like a stabilized pesticide formulation and a novel chocolate milkshake composition, this canola oil exemplifies the scope of agrifood nanotechnology. [Jennifer Kuzma](#) and [Peter VerHage](#) from the University of Minnesota [Humphrey Institute of Public Affairs](#) mention these applications of nanotechnology in their [analysis](#) of early stage agrifood nanotechnology research and development - a study conducted*

*at request of the [Project on Emerging Nanotechnologies](#). Kuzma and VerHage have developed a method to anticipate what food-related applications and products are likely to appear over the coming years. Their work, which has resulted in a [draft database](#) of nanotech food and agriculture-related research, looks at the landscape of research investments being made by the USA government. The database dates from 2006 and contains descriptions of projects from institutions like the [USDA Agricultural Research Service](#).*

## Nano: what is in a name?

Nano is a derivative of *váννος* [nános], the Greek word for dwarf. One nanometer (nm) is  $10^{-9}$  of a meter. [Nanotechnology](#) or simply nanotech is a quite new scientific discipline that covers a diversity of specialties, including nano-agriculture, nano-medicine and nano-electronics. Nanotechnology generally deals

with the study and development of particles and structures with at least one dimension of 100 nanometers or smaller. In some respects [nanoparticles](#) behave differently from their bulk equivalents. As a consequence of this nanosized products may have 'novel' properties.

## Dossier particle size

Beneficial nutrients news highlights different aspects of ultrafine (nano and submicron) fertilisers.

- ▶ **Nanotech on farmers' fields**
- ▶ First nano fertilisers come onto the market
- ▶ Farming with ultrafine rocks
- ▶ Ultrafine grinding techniques