SOIL MIXTURE BEHAVIOR

The following was abstracted from an article on: "Injection molding research paves the way to ceramic engine parts" by B.C. Mutsuddy in the July issue of *Industrial Research and Development.* It has some implications to us when we mix different components together to come up with a new soil mix. Something we may have always known but stated in a different way. The author talks about tailoring ceramic powders to obtain high packing densities. When he talks about "particles" think of "soil particles" or perlite particles or sand particles, etc. "Packing density" would mean to us "bulk density" or how heavy the mixture is, and how tight it will be.

"Particle sizes range from spheres to fibers or platelets, all of which have different packing characteristics. The spherical shape usually is regarded as having the highest packing densities.

"It should also be realized that platelet-shaped particles seldom are the only constituents of a powder . . . It appears that no real benefit can be realized by using platelet shaped particles.

"Particle arrangement also is an important factor in achieving high packing densities . . . Spheres can nest together in a variety of configurations, each having a different volume density.

In commercial powder handling, the particle arrangement will be . . . random, and its effect on powder packing will be difficult to separate from the effects of such things as particle size and distribution.

". . . the highest packing densities will be achieved if the particle sizes are not uniform. This enables finer particles to fill the holes between larger particles. The particle size range can be broadened by either mixing two or more particle sizes, or by continuously changing particle size throughout a wide range. Increasing the number of particle sizes in a mixture can increase the packing density.

"Particle agglomeration becomes a significant problem with decreasing particle size. As particle size decreases, the surface area to volume ratio increases and surface effects begin to influence particle behavior. Various forces begin to influence particle behavior, leading to formation of small particle agglomerates that resist being broken into individual particles. The high porosity in these agglomerates lead to low packing density."

This little abstract, in an entirely different field, emphasizes the fact that potting mixtures with a wide range of particle sizes are likely to be heavy with high compaction.

Emerson, John. 1983. Evolution internationale dans le domaine des couts et des prix de l'energie. Rev. Energ. 33:731-737.

During the 1980s, oil is expected to remain the marginal source of energy supply. Natural gas will, in most cases, be priced at parity with oil at the point of consumption, and coal will continue to have a competitive edge. Based upon the economic outlook, it will remain a buyer's market for induced supply disruptions, the economics of scarcity could force oil prices higher to an extent that cannot be determined at this time. Oil, gas and coal costs will vary widely from one region to another. Most of the economic rent — roughly, the difference between cost and price — will find its way into government treasuries.

M.G.D. 1983. Synthese van onderzoek op de gebruikswaarde van rozenonderstammen. Verbondsnieuws voor de Belgische Sierteelt. 27:69, 71-73.

Data presented from several years trials with 10 rose understock (including 6 *Rosa canina* cultivars), varying in vigor and susceptibility to powdery mildew. In a trial, comparing the budding success of 7 rose cultivars, the success rate varied widely both between rootstocks budded with the same cultivar and between cultivars budded onto the same rootstock. In a trial comparing *R. multiflora* and *R. laxa R. coriifolia* cv 'Froebelii', the percentage bud taken was higher on *R. laxa* rootstocks of 2 size grades, there was little difference in budding success. But, there were more bushes with 3 or more branches on the larger sized rootstocks. In a trial comparing 3 *R. canina* cultivars, *R. laxa* and *R. rubiginosa,* the budding success rate was the highest on *R. laxa.*