

GUIDELINES FOR VAST INTERPRETATION



TECH MEMO 0017-8

SOLVITA VAST AND EFFECTS OF TEXTURE

Solvita VAST is a newly released protocol enabling labs to rapidly determine soil water stable aggregates. The method employs a volumetric-surface area approach instead of a gravimetric, weight-based approach to speed the test and provides accurate estimates of the volume of soil held in aggregated form. As part of the release to soil labs, a general interpretation was proposed (see Table 1). This memo provides some insights into interpretation and precautions concerning the influence of texture on VAST results.

Table 1.
General
Model

VAST %	KEY
0 — 15	very low
15 — 30	low
30 — 45	moderate
45 — 60	very good
> 60	excellent

The VAST guide (see left) assumes soils possess some content of clay enabling a medium ribbon to be drawn by the USDA feel test¹. However, there is a strong relationship of soil texture (sand, silt and clay portions) to aggregate forming capacity, and therefore the more sandy or gritty a soil is generally the lower the aggregates will be. VAST measures sand but does not attempt to “correct” reported results as other methods do. There may be pro arguments for exclusion of sand in reporting aggregates, but doing so obscures the reality of sandy soils as it also excludes consideration that sandy soils can be well aggregated by organic matter amendments stimulating fungal hyphae². A good approach is to

take account of sand content to modify the interpretation.

Soils which fall into sandy and gritty loam classes have a limited ability to form a ribbon when a wet soil ball is rubbed between the fingers. Such sandy soils are very common on Northeast USA farms. In this case we shift the interpretation downwards as shown in Table 2.

Interpretation of any soil test, especially soil health tests, must consider the soils eco-region, and it is a good idea to note both texture (sand, silt, clay analysis) and other traits of soil origin. The best interpretation is gained by repeated tests over time.

A survey of 2,600 soil health tests conducted with VAST for North America revealed that 2/3 of farm soils are in the Low to Very Low category using the general model. The small 5 percentile group of soils found in the Excellent category were examined and included long-term rotation plots, CRP's and non-tilled pastures but all also contained ribbon-forming clay. This supports the proposed concept that interpreting within the framework of other known soil properties will improve the meaningfulness of standard interpretations.

Sandy+Loams- fine, gritty, little clay

0 to < 5	Very Low
5 - 15	Low
15 - 20	Moderate
20 - 35	Very Good
≥ 35	Excellent

Table 2.
Modified
Scheme

Table 3. VAST Soil survey

RANGE OF USA SOILS IN VAST CATEGORIES†

VAST %	Rating	% of Soils	Poor/ Good
0 to < 15	Very Low	31%	65%
15-30	Low	34%	
30-45	Moderate	22%	35%
45 - 60	Very Good	8%	
≥ 60	Excellent	5%	

† (2017) 2650 soils; Woods End Labs Tech Memo- VAST

¹ USDA-NRCS Soil Textural Guide https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_054167 see also: S.J. Thien. 1979. A flow diagram for teaching texture by feel analysis. Journal of Agronomic Education. 8:54-55

² Degens et al. (1996) Increasing the length of hyphae in a sandy soil increases the amount of water-stable aggregates. Applied Soil Ecology 3 (1996) 149-159 ALSO: Thornton, R.H., Cowie, J.D., McDonald, D.C., 1956. Mycelial aggregation of sand soil under Pinus radiata. Nature 177, 231-232.