Modification of existing de-watering press under realistic site conditions in Africa.

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• Existing technology
• Efficiency
• Trials - hydraulic pulsed
• Hydraulic pulsed + vacuum
• Summary & conclusions
Typical de-watering press, Africa
Hydraulic system (old)
Variation in m.c.
Internal variation (with height) in m.c.
Hydraulic test rig.
Pulsed pressure / retraction / pause
+/- vacuum

Results - middle column
Pulsed pressure / retraction // pause +/- vacuum

Results - rear column

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Summary

The best individual sample = 35.48%.
The best average of vertical samples = 38.46%.
The best average of horizontal samples = 38.2%
The worst (highest moisture contents) occurred in the front of the press where there are no constraints.
The greatest variation in moisture contents came from samples at the rear of the press (38.3% 46.3%)
Conclusions (1)

**Basic dewatering press design.**

The use of unconstrained presses (open fronted) relying on the strength of the PP sacks is extremely bad. Large gaps between rear members are also leading to higher m.c in parts of this area, due to lack of constraint. Sides should also include drainage slots. Floors need to include drainage, both because this would help the bottom layer to drain and also since these are buckling slightly and ponding. Use of thin plate spanning distances should be avoided, and all containment needs to have strength in the axial direction.
Conclusions (2)

Pulsed and vacuum system

The use of a pulsed high pressure system gave some extremely good results, although these were limited by the overall performance of the modified press as above. 36% m.c. can be achieved, and the variation of m.c. spatially within the press can be reduced probably to 1%. The financial implications of this are a fuel saving of 5%. At current prices the payback will easily justify the investment. Although there is added complexity there is a benefit in terms of consistency as well as the financial one.
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