Storage Capacity

Why measure product volume

Different grains and components of grain have different weights. To be able to design, manage and secure a rice storage facility, the weight and volume relationships for rice paddy and milled components must be known.

Weight and volume for paddy rice and its milled components

	Bulk (kg/m3)	Bag (bags/ton)	Weight per bag
Paddy or seed rice	600-650	13-25	40-80 kg
White rice	850-900	20-25	40-50kg
Bran or meal	550-600	20	50kg
Husk	120-140	50-100	10-20 kg

Note -There will be12-13 filled rice bags per 1 m3 of storage space (bags have a flat dimension of 1.0m long x 0.5 wide and weigh approximately 50kg)

Determine the storage capacity for different types of bulk storages

Bulk storage structures come in different shapes and sizes.

- Square or rectangular bin:

    Volume = (length x width x height) x bulk density (kg/m2)

- Tower silo with flat bottom

    Volume = (22/7 x radius x height) x bulk density (kg/m2)

- Tower silo with cone bottom:

    Volume cylinder= (22/7 x radius x height) + volume of cone = (1/3 (22/7 x height)) x bulk density (kg/m2)

- Grain pile on a pad

    Volume (length x width x 0.73 (grain coefficient))

In many open storages allowances must be made for the angle of repose of grain (angle on the top of the grain stack). The angle of repose for rice, which is allowed to freely fall into a pile, is approximately 36 degrees.