

New Technology for Post-harvest Drying and Storage of Horticultural Seeds



Peetambar Dahal
Department of Plant Sciences
University of California
Davis, CA, USA



Kent J. Bradford
Department of Plant Sciences
University of California
Davis, CA, USA



Keshavulu Kunusoth Acharya
NG Ranga Agricultural University
Hyderabad, India



Jwala Bajracharya
Seed Technology and Research Division
Nepal Agricultural Research Center
Kathmandu, Nepal



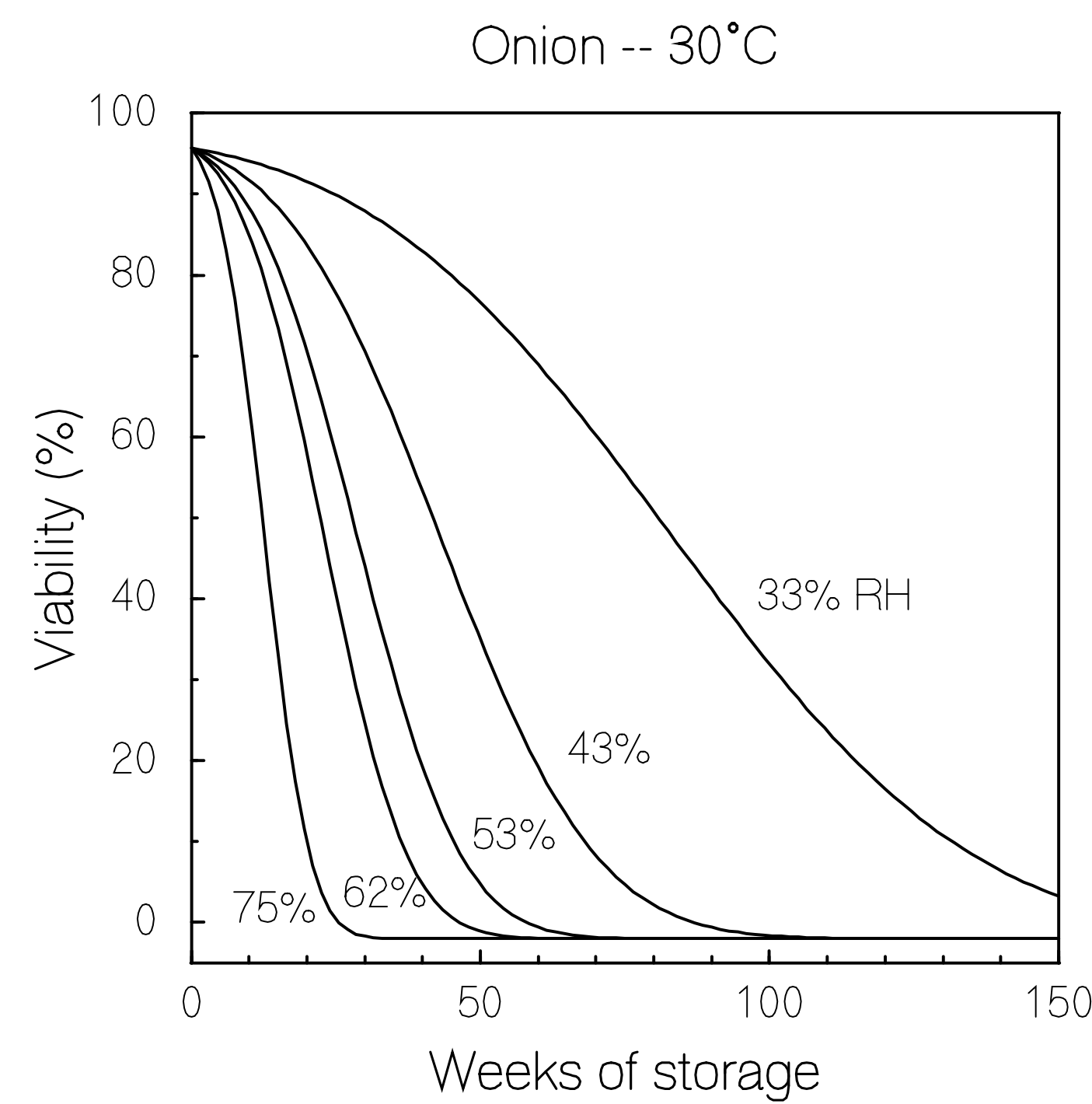
Bhartendu Mishra
Seed Technology and Research Division
Nepal Agricultural Research Center
Kathmandu, Nepal



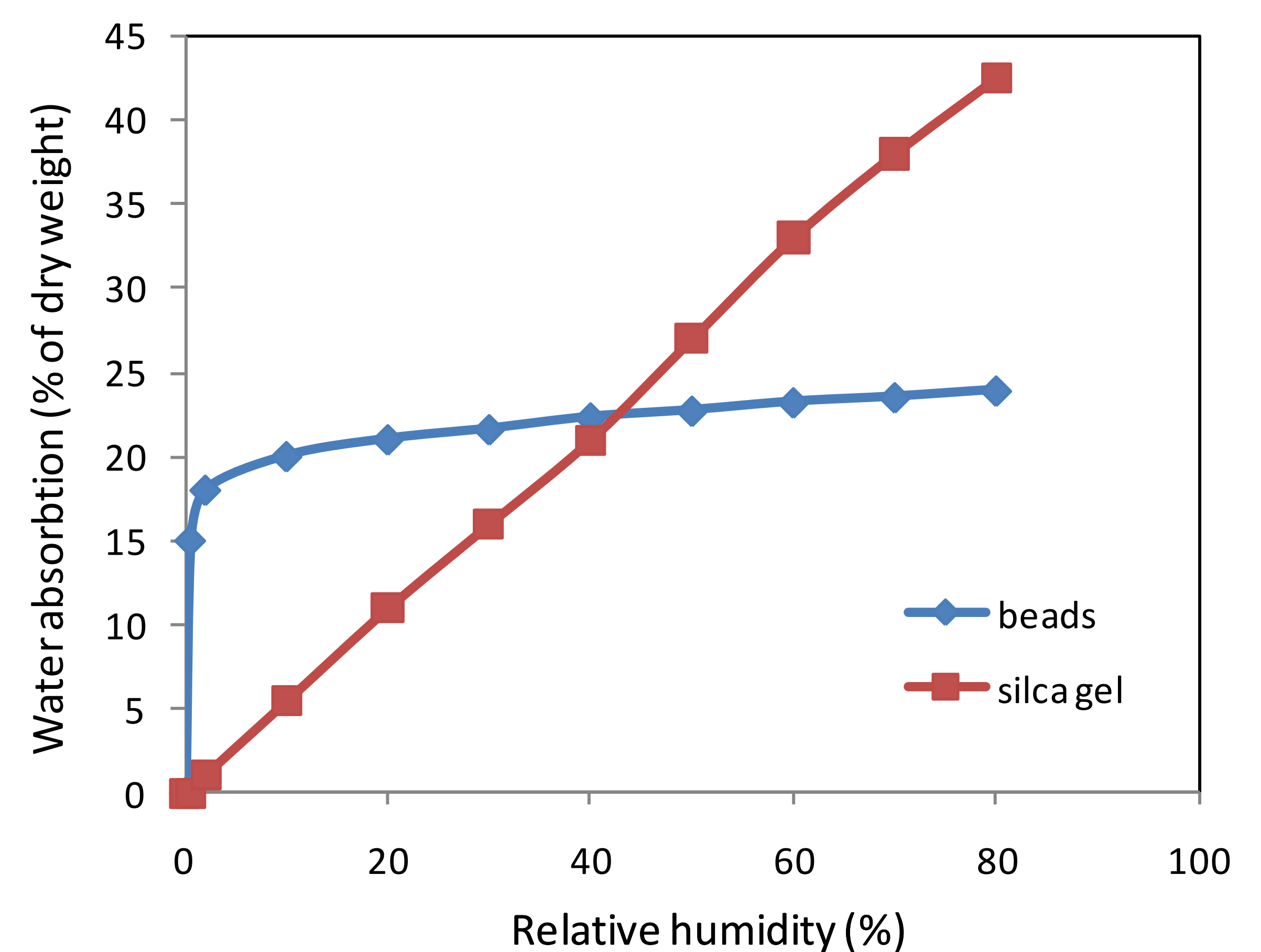
Johan Van Asbrouck
Rhino Research
Phitchit, Thailand

High quality seeds of improved varieties are essential to enhance the production of annual horticultural crops. In tropical climates, high temperatures and humidities combine to cause rapid deterioration of seeds in open storage, resulting in loss of value, poor stand establishment, lower productivity and disincentive to invest in improved seeds. Most horticultural seeds in the targeted locations are locally produced or self-saved and are stored without facilities for drying them to moisture contents that would greatly extend their storage lives.

We will demonstrate a simple, inexpensive and widely adaptable method for drying horticultural seeds and maintaining high seed quality during storage. A novel zeolite bead desiccant, combined with inexpensive hermetic containers, can both dry horticultural seeds and maintain them in a dry state during storage, greatly increasing their storage lifetimes. This simple seed drying and storage system would enable the development and distribution of more productive varieties, marketing of higher quality products and increases in women's and families' incomes.



- Seed longevity is reduced by approximately half for every 1% increase in seed moisture content (MC) or 5°C increase in temperature, and the effects of moisture and temperature are additive.
- At low moisture levels, the loss of seed quality and longevity is much less affected by high temperatures.



- Zeolite beads are more effective than silica gel in absorbing water at low relative humidities. This enables them to dry seeds to very low moisture contents for ultra-dry storage.
- We are testing this system in India, Nepal and Thailand.

- Seeds are hygroscopic and will absorb or lose water in relation to the ambient air humidity. Open storage of seeds in humid tropical regions results in high seed MC.
- Seeds stored in cloth or paper bags become equilibrated with the ambient air humidity, but hermetic packaging maintains low seed moisture content.
- In lieu of humidity-controlled and air-conditioned storage facilities, which require expensive and reliable energy sources to run and maintain, seeds can be ultra-dried and sealed in hermetic containers without need of temperature control.



Seed storage trials and educational meetings are being conducted at the circled locations using seeds of onion, tomato, cucumber, cantaloupe, watermelon, bitter melon, and marigold.