

Dry Chain & Dry Store

MAKING THE DIFFERENCE IN DRYING
RHINO RESEARCH GROUP

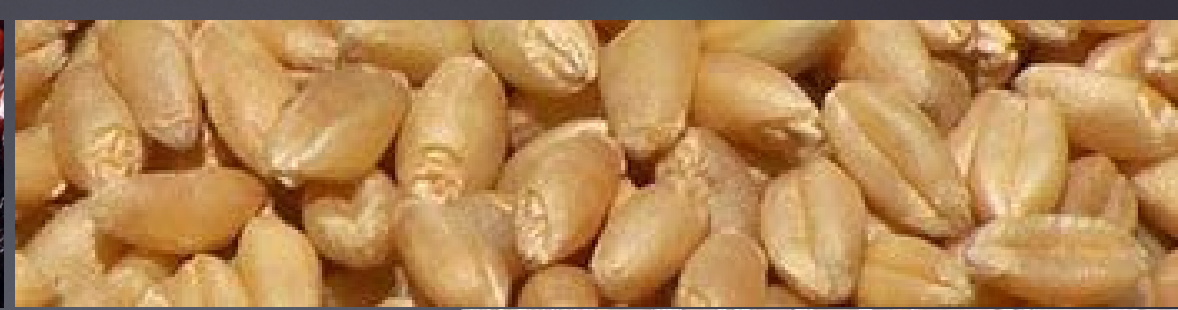


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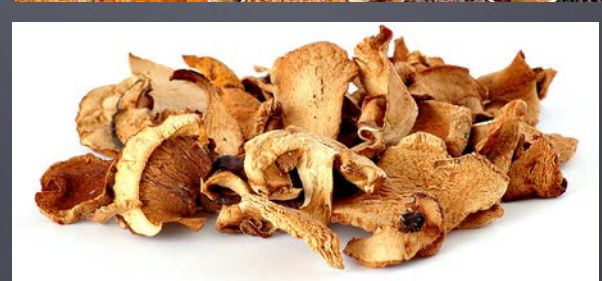
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The Cold Chain is not the answer for many commodities





Make it
Keep it **DRY**

The Dry Chain Concept
Is the answer

THE PROBLEM IS HUMIDITY

Developing a system that
is affordable, easy, fast,
efficient and with low
investment costs?

IF WE WANT TO ENABLE GROWERS TO DRY THEIR
PRODUCTS AND REAPING THE BENEFITS FROM THEIR
OWN WORK



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Process development

- small scale versus Industrial
- Manual versus full automatic
- Batch & continuous systems
- ...

Characteristics

- Made from clay (zeolite)
- Ceramic product – Crystal form
- Absorbs only water (Pore size 3 Å)
- Food grade, non toxic
- Absorbs up to 30% water
- Exothermic reaction
- Action is extremely fast
- Minimum RH obtained equals 0%
- Perfectly reusable (+1,000 times)



Drying Beads ®



- 1.6 liter DryBox
- 8.0 liter DryBox
- 16.0 liter DryBox
- 50 liter DrumDry
- 100 liter DrumDry

- QualiDry
- FlexiDry
- MobiDry



Tasting the impact

SOME EXAMPLES WHERE THIS TECHNOLOGY MAKES
THE DIFFERENCE



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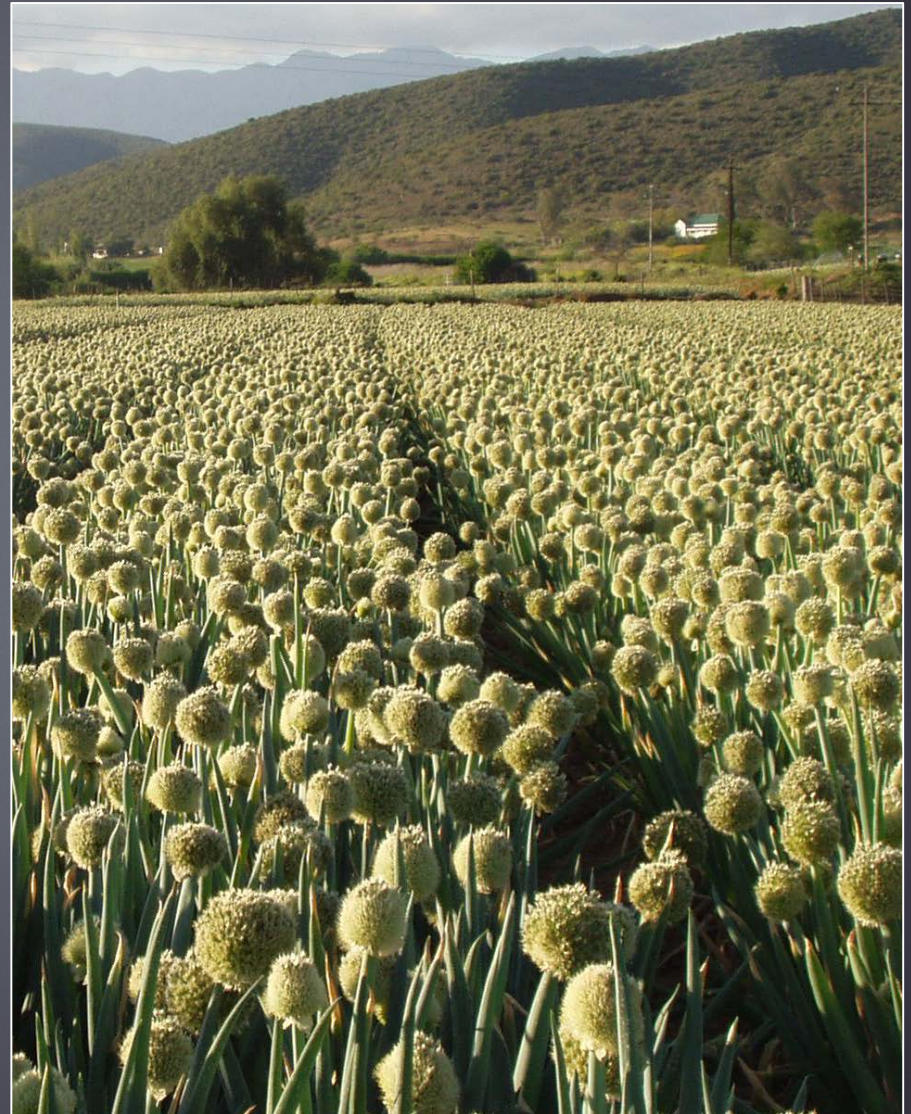
Seed Drying and Storage in Bangladesh

SMALL GROUP PEOPLE
MAX 7 -10 PEOPLE

7 WEEKS / 2 YEARS

PRACTICAL, THEORETICAL
PERSONALLY ADAPED

TESTING CONCEPT
ANALYZING RESULTS



Impact from Lal Teer Seed Company

	kg seeds		avg kg per	prod farmers		gr seed per	growers reached	
	2016	2017	prod farm	2016	2017	grower	2016	2017
tomato	500	600	25	20	24	10	50,000	60,000
chili	300	300	30	10	10	10	30,000	30,000
eggplant	400	1,000	25	16	40	10	40,000	100,000
papaya	50	50	10	5	5	5	10,000	10,000
bittergourd		14,000	70	0	200	50	0	280,000
onion		300	60	0	5	1,000	0	300
cucurbits		2,000	20	0	100	50	0	40,000
okra		3,000	100	0	30	100	0	30,000
	1,250	21,250		51	414		130,000	550,300
						avg crops/farm		
						5	26,000	110,000

	total	male	female
training given direct way to own staff (phase 1)			
1 day training	48	42	6
3-5 day training	8	4	4
this staff will directly supervise and support the seed production farmers			
	2016	51	48
	2017	363	344



22,500 Kg hybrid seeds

56 staff

466 seed production farmers

110,000 growers

LESSON LEARNED

“ Start the implementation
by those who are benefitting
most “



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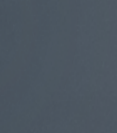
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Some other applications

CHILI & SPIRULINA



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Chili powder

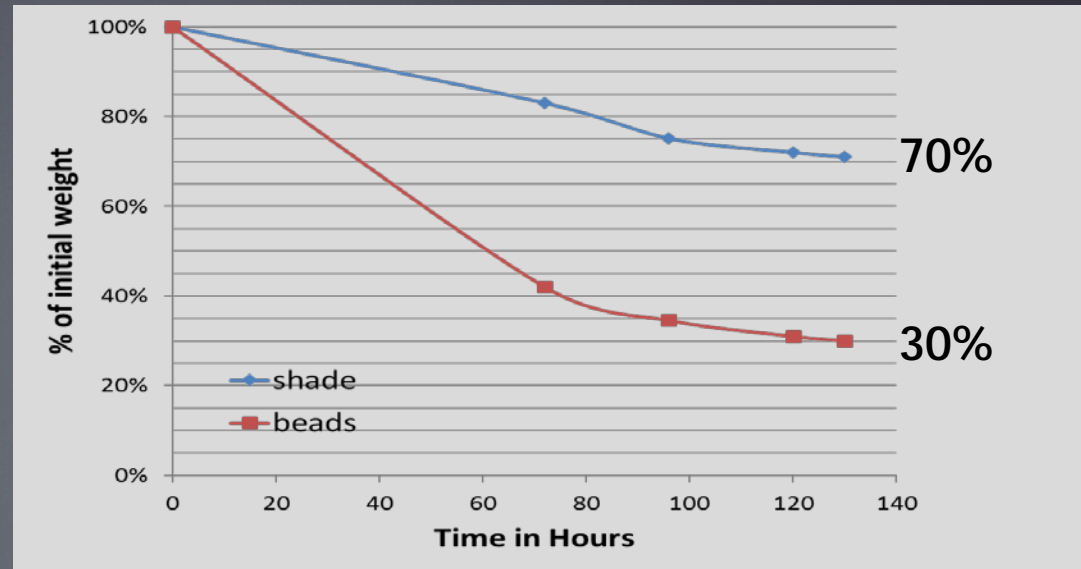
Chili powder is the dried, pulverized fruit of one or more varieties of chili pepper, sometimes with the addition of other spices. It is used as a spice to add pungency or piquancy and flavor to dishes.

Often harvests are destroyed due to fungal growth (insufficient ability to dry after harvest). Breeding is often focused on maintaining the color during the drying of the chillies.



Drying Chili

- In the sun (under shade for maintaining some of the nutritional value as well as the color) we were able to reduce the initial weight with a 30%
- With drying beads (maintaining the total aspect of nutritional values as well as color and pungency) we were able to reduce the initial weight with a 70%



Shade dried



Bead dried



Spirulina

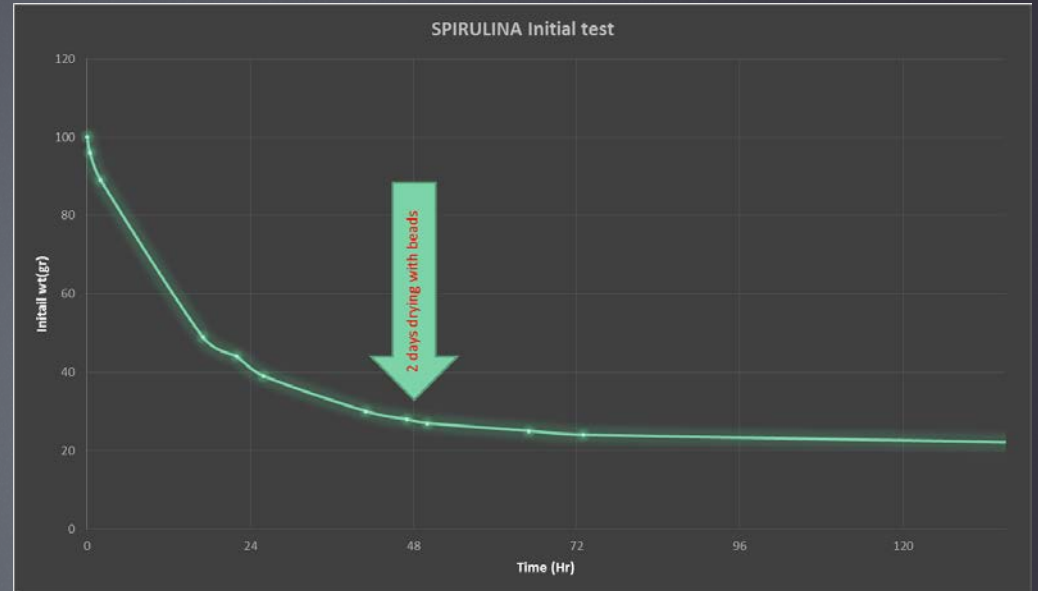
Spirulina is a natural "algae" (cyanobacteria) powder that is incredibly high in protein and a good source of antioxidants, B-vitamins and other nutrients. When harvested correctly from non-contaminated ponds and bodies of water, it is one of the most potent nutrient sources available.

It is largely made up of protein and essential amino acids, and is typically recommended to vegetarians due to its high natural iron content.



Drying Spirulina

- From 75% moisture content (and thus only storable for a few days in a fridge) to a 5% moisture content in 2 days (and storable for a quite long period in an ambient atmosphere)
- During the drying the nutritional value is perfectly maintained
- System is easy, straightforward and need little investment
- In collaboration with Urban Harvest (Skyline Spirulina) and Winrock



LESSON LEARNED

“ Drying seeds is just a start.
Postharvest needs and
beyond are huge and the
impact will be enormous “



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Thank you for your attention

Do you have questions, or some ideas how these technologies can help you?
Just contact us and we can see how to cooperate together



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