



Terra-Fresh

Forward Opportunity Marketplace

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<http://ilpil.asu.edu>, www.terra-fresh.com



Agenda

- Introduction and Vision
- Supply Chain Articulator
- Planning Tools and Coordination
- Demonstration
- Potential Impact
- Closing Remarks

Introduction and Vision

There is an opportunity in turning future market opportunities (3 to 12 months) into production plans. This provides further vision to buyers/consumers and sellers/producers in what we call **Forward Marketplace**.

With the proper framework the identified opportunities can be allocated to producing regions (planning units), and furthermore to specific growers, resulting in production and supply plans.

We define the Forward Marketplace as follows:

“A digital environment to match future production and demand of fresh produce.”

Supply Chain Articulator

A key element of this envisioned system is the role of the Supply Chain Articulator, who will:

- Focus on a specific production region
- Represent the growers in that region
- Serve as a connection and coordination agent between growers, logistics agents, and consumers/buyers
- Turn market opportunities into production plans
- Coordinate and oversee the production plan development and execution
- Coordinate produce aggregation and logistics

This specialized agent is not physically part of the supply chain. His task is to coordinate and articulate its operation.

Planning Tools and Coordination

- **Model 1: Land Allocation Tool**

Perspective of a single grower
Single region
Up to 7 crops
Demand based on expected prices



Planting and harvesting plan
Allocates available land to selected crops

- **Model 2: Contract Response Tool**

Perspective of the SC articulator/buyer
Single region
Up to 7 crops
Demand based on a contract and expected prices



Planting and harvesting plan
Plan to supply the contract demand
Determine how much land is needed

- **Model 3: Contract Response Tool (multi-location)**

Perspective of the SC articulator/buyer
Up to 6 regions
Up to 7 crops
Demand based on a contract and expected prices



Planting and harvesting plan
Plan to supply the contract demand
Determine needed land in each region
Takes advantage of complementary regions

Planning Tools and Coordination

- **Model 4: Contract Allocation Tool (multi-growers)**

- Perspective of the SC articulator
- Multiple growers
- Multiple crops
- Considers each **registered grower's** individual profile and parameters
- Demand based on a request or demand signal (**identified opportunity**)



Planting calendar for each crop

Planting calendar for each grower

Estimated harvesting plan and aggregation plan

Allocates available land to selected crops

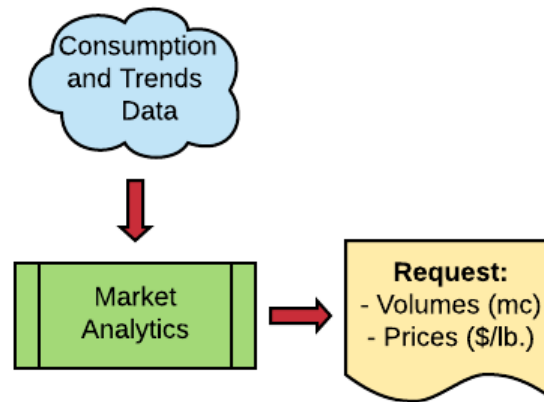
Case Study

Regions:

- Albuquerque, NM
- Aspen, CO
- Las Cruces, NM
- Phoenix, AZ
- Tucson, AZ
- Yuma, AZ

Current products:

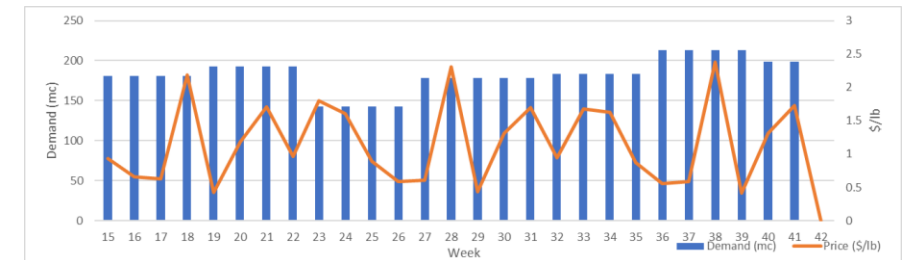
- Tomatoes
- Bell Peppers
- Lettuce
- Green Beans
- Celery
- Cauliflower
- Cucumber



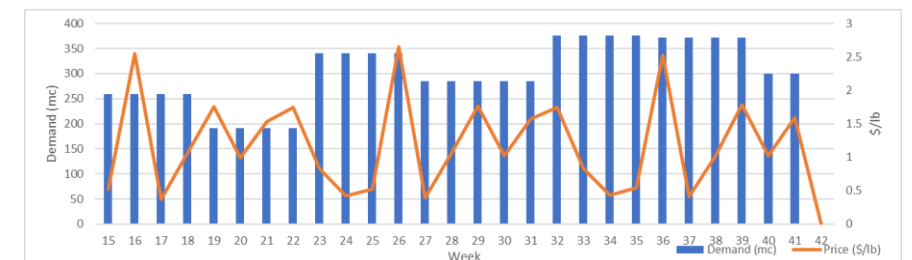
New opportunity for:

- Chayote
- Brussels Sprouts
- Spinach

Request for Chayote

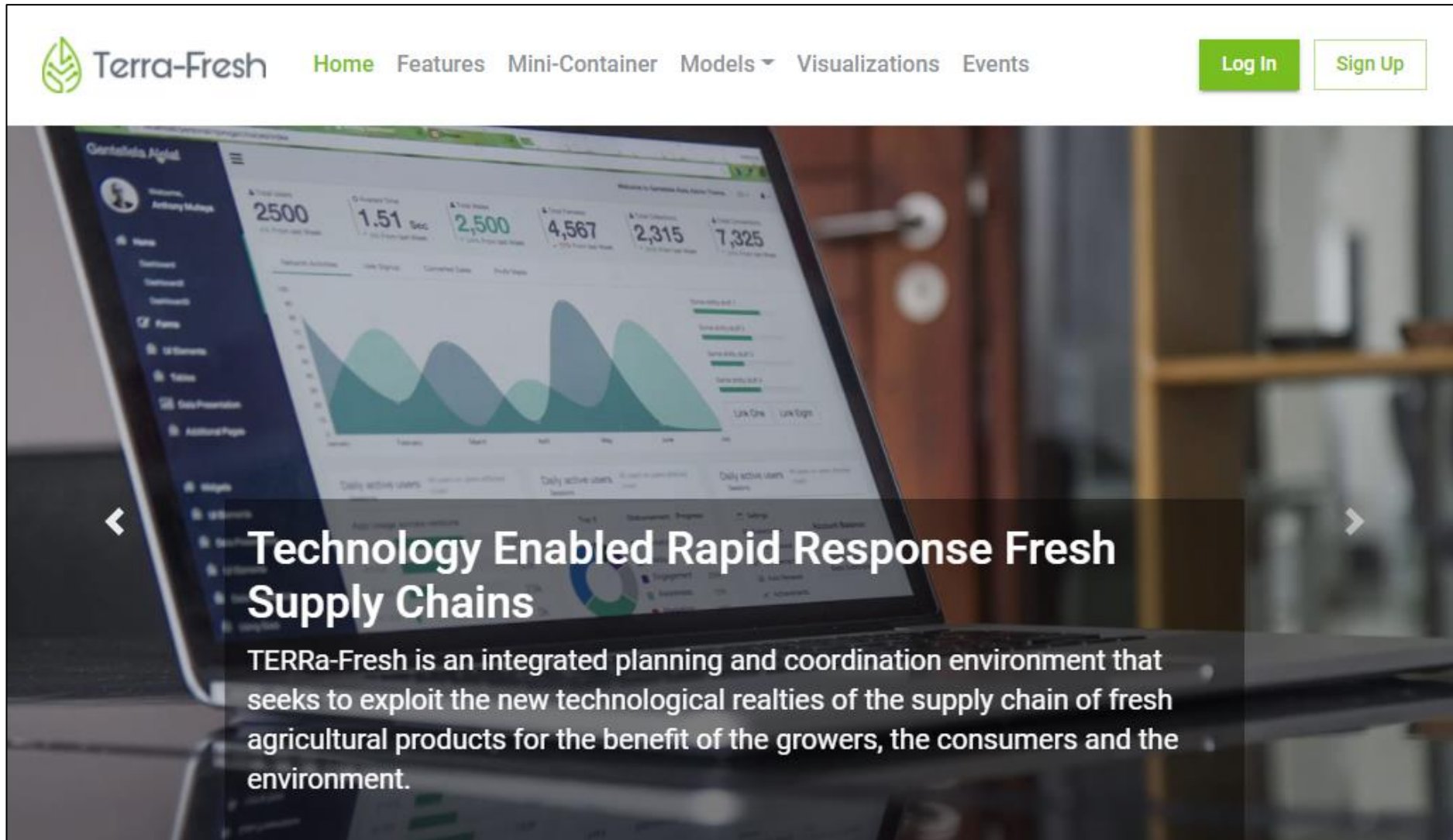


Request for Brussels Sprouts



Demonstration

www.terra-fresh.com



The screenshot displays the Terra-Fresh web application interface. At the top, the logo is followed by navigation links: Home, Features, Mini-Container, Models, Visualizations, and Events. On the right, there are 'Log In' and 'Sign Up' buttons. The main dashboard area features a sidebar with a user profile and a list of menu items. The central content area includes several key performance indicators (KPIs) such as 'Total Users' (2500), 'Support Time' (1.51 Sec), 'Total Items' (2,500), 'Total Orders' (4,567), 'Total Customers' (2,315), and 'Total Comments' (7,325). Below these are charts and graphs, including a line chart showing trends over time and a bar chart. A semi-transparent text box is overlaid on the bottom half of the dashboard.

Technology Enabled Rapid Response Fresh Supply Chains

TERRa-Fresh is an integrated planning and coordination environment that seeks to exploit the new technological realities of the supply chain of fresh agricultural products for the benefit of the growers, the consumers and the environment.

Potential Impact

Initial Scenario: Current produce portfolio

Mini-Containers Delivered

Grower	BNS	CAUL	CEL	CHY	CUX	PEP	TOM	Total
gr1	184	271			503	139	1411	2508
gr3	97	63			130	392	557	1240
gr4						566		566
gr5			700	29	78	108		914
gr7							170	170
Total	281	334	700	29	711	1205	2138	5398

Planted acres

Grower	BNS	CAUL	CEL	CHY	CUX	PEP	TOM	Tot
gr1	1	2			3	1	8	15
gr3	1	1			2	4	8	15
gr4						5		5
gr5			4	1	3	2		10
gr7							4	4
Tot	2	3	4	1	7	12	20	

Grower	Cost_Lab	Cost_log	Cost_Plant	Cost_trans	Income	Profit
gr1	\$ 7,552	\$ 326	\$ 32,115	\$ 30	\$ 2,589,414	\$ 2,549,391
gr3	\$ 6,662	\$ 161	\$ 28,680	\$ 15	\$ 1,104,427	\$ 1,068,909
gr4	\$ 2,752	\$ 74	\$ 20,710	\$ 7	\$ 448,420	\$ 424,878
gr5	\$ 4,157	\$ 119	\$ 41,420	\$ 11	\$ 504,605	\$ 458,898
gr7	\$ 2,251	\$ 22	\$ 14,136	\$ 2	\$ 121,720	\$ 105,309
						\$ 4,607,386

Spot Cost	\$ 2,831
Total Profit	\$ 4,604,555

Potential Impact

New Scenario: Including new Opportunity

Mini-Containers Delivered

Grower	BNS	BRSP	CAUL	CEL	CHY	CUX	LET	PEP	SPN	TOM	Total
gr1	221	130	250				889			816	2306
gr2		61								295	356
gr3				200	105	206	122	480		402	1515
gr4			135						101	222	459
gr5	88			588	52	50	76	113			968
gr6						381		831	101	468	1781
gr7									170	122	293
Total	310	191	385	788	158	637	1087	1424	372	2326	7678



Planted acres

Grower	BNS	BRSP	CAUL	CEL	CHY	CUX	LET	PEP	SPN	TOM	Tot
gr1	2	1	2				6			5	15
gr2		1								6	7
gr3				1	1	2	2	4		5	15
gr4			2						1	2	5
gr5	1			4	1	1	1	2			10
gr6						3		7	1	3	13
gr7									3	2	4
Tot	3	2	3	5	2	5	9	13	5	23	

Grower	Cost_Lab	Cost_log	Cost_Plant	Cost_trans	Income	Profit
gr1	\$ 7,608	\$ 300	\$ 32,115	\$ 28	\$ 1,141,237	\$ 1,101,187
gr2	\$ 33,037	\$ 46	\$ 9,716	\$ 4	\$ 250,640	\$ 207,836
gr3	\$ 7,071	\$ 197	\$ 28,680	\$ 18	\$ 1,277,180	\$ 1,241,214
gr4	\$ 2,673	\$ 60	\$ 20,710	\$ 6	\$ 344,143	\$ 320,695
gr5	\$ 4,595	\$ 126	\$ 41,420	\$ 12	\$ 466,326	\$ 420,173
gr6	\$ 46,996	\$ 232	\$ 20,475	\$ 21	\$ 2,030,535	\$ 1,962,811
gr7	\$ 2,580	\$ 38	\$ 14,136	\$ 4	\$ 266,585	\$ 249,827
						\$ 5,503,744

Spot Cost	\$ 1,954
Total Profit	\$ 5,501,790

\$ 897,235


Closing Remarks

In summary, we presented:

- A new vision to how to articulate supply chains in response to demand signals
- The Supply Chain Articulator as a key role to enable the coordination of production activities with consumer's demand
- Planning models that support the envisioned environment and the efficient creation of responsive supply chains
- An integrated approach to capture an identified demand and translate it into an executable plan for the producing and logistics activities

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