

Growing onions more cheaply

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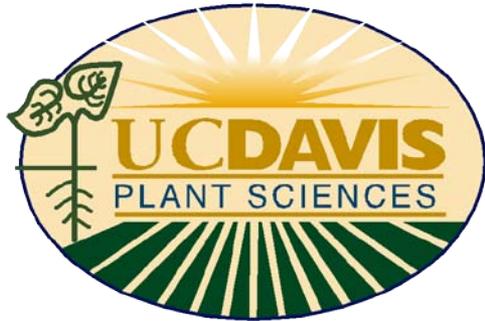
California Garlic and Onion Symposium 2012

Agriculture Building Auditorium

UC Cooperative Extension Tulare County

February 13, 2012

Thank you for the opportunity to be
with you this afternoon.



Partners



Tom Turini
Kurt Hembree
Anil Shrestha
Joe Coelho
Pete Dominguez
John Diener
Scott Schmidt
Armando Galvan
Dan Munk







**No-till onion experimentation
Patos de Minas, BRAZIL
2006**



**High residue no-till established
onion seedlings
Patos de Minos, BRAZIL
2006**



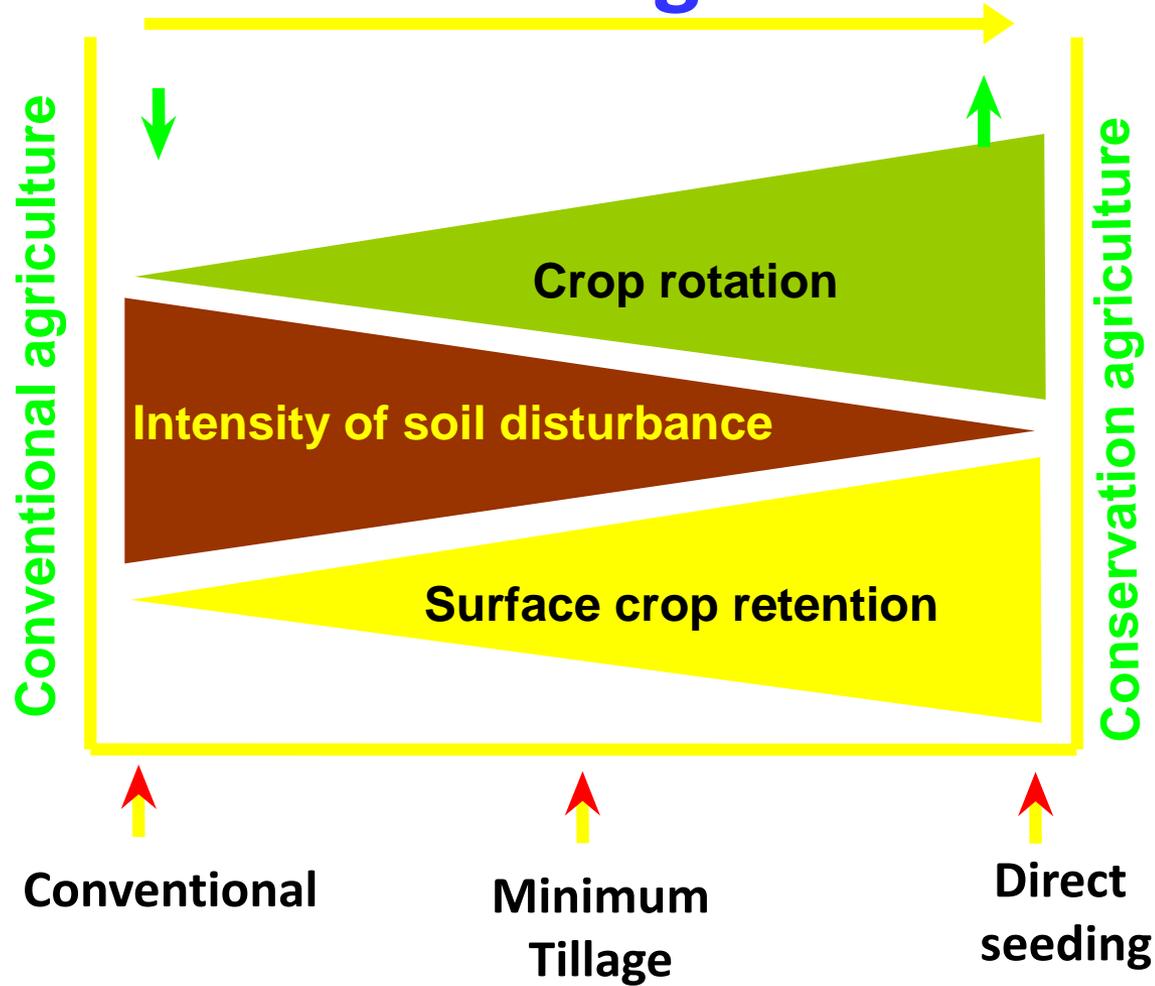


**No-till tomato transplanting
Turkey
2009**





Sustainable agriculture





CONSERVATION AGRICULTURE

- ... has developed to be a technically viable, sustainable, and economic alternative to current crop production practices,
- ... is gaining acceptance in many parts of the world as an alternative to both conventional agriculture and organic agriculture
- ... is the integration of ecological management with modern, scientific, agricultural production



CONSERVATION AGRICULTURE

- ... is not 'business as usual,' based primarily or solely on maximizing yields,
- ... rather, it is based on optimizing yields and profits to achieve a balance of agricultural, economic and environmental benefits,
- ...it advocates that the combined economic and social benefits gained from combining production and protecting the environment, including reduced input and labor costs, are greater than those from production alone.



CONSERVATION AGRICULTURE

- Minimal soil disturbance
- Preservation of residues that provide permanent soil cover
- Diverse crop rotations
- Use of cover crops
- Integrated pest management
- Reliance on precision, highly efficient irrigation
- Controlled or limited mechanical traffic over agricultural soils



”More with Less”

... agriculture in the future will have to sustainably produce more food, feed, fiber and energy on less land through more efficient use of natural resources and with minimal impact on the environment in order to meet growing population demands.

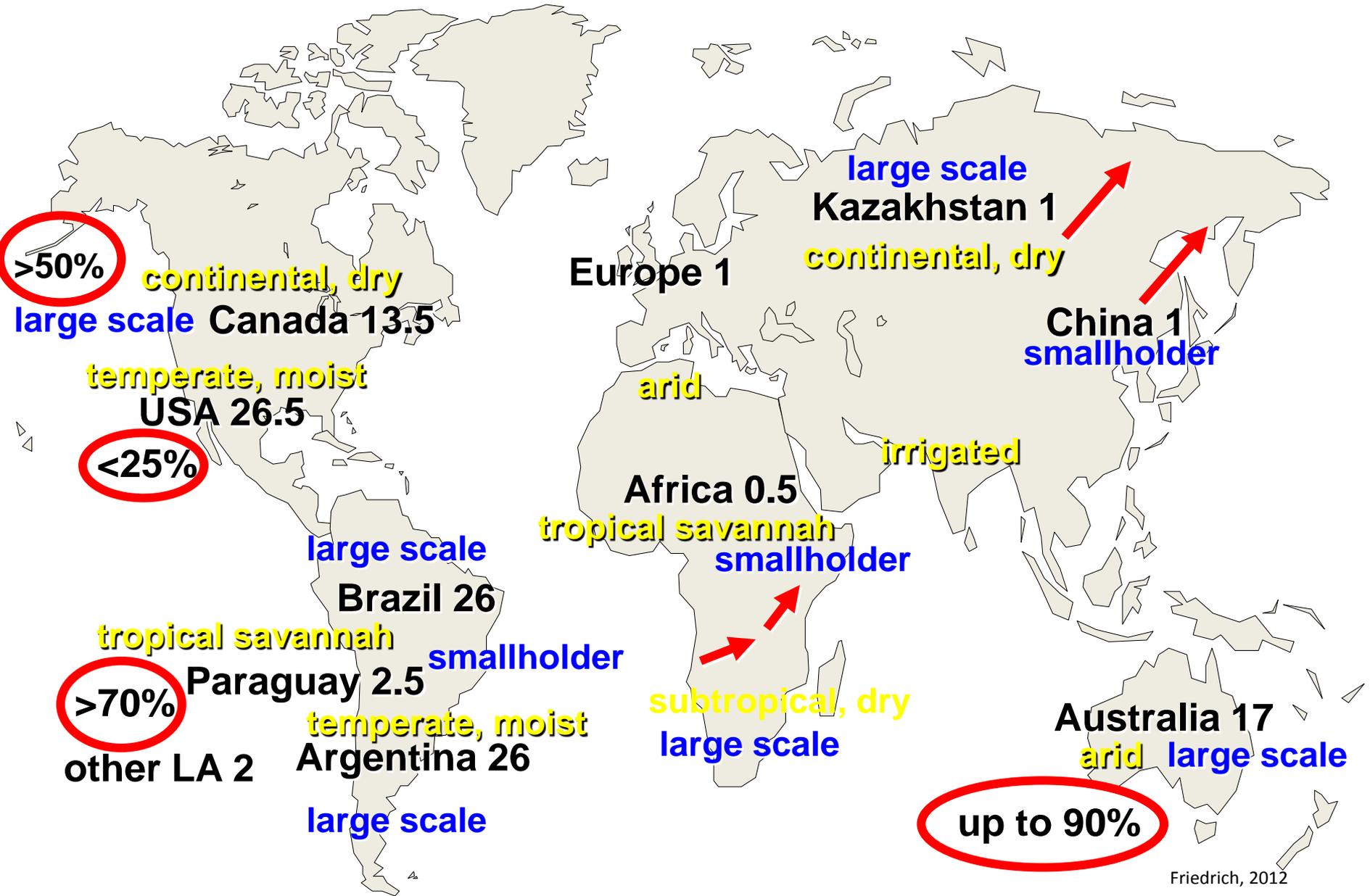
This will become a global imperative.



CONSERVATION AGRICULTURE

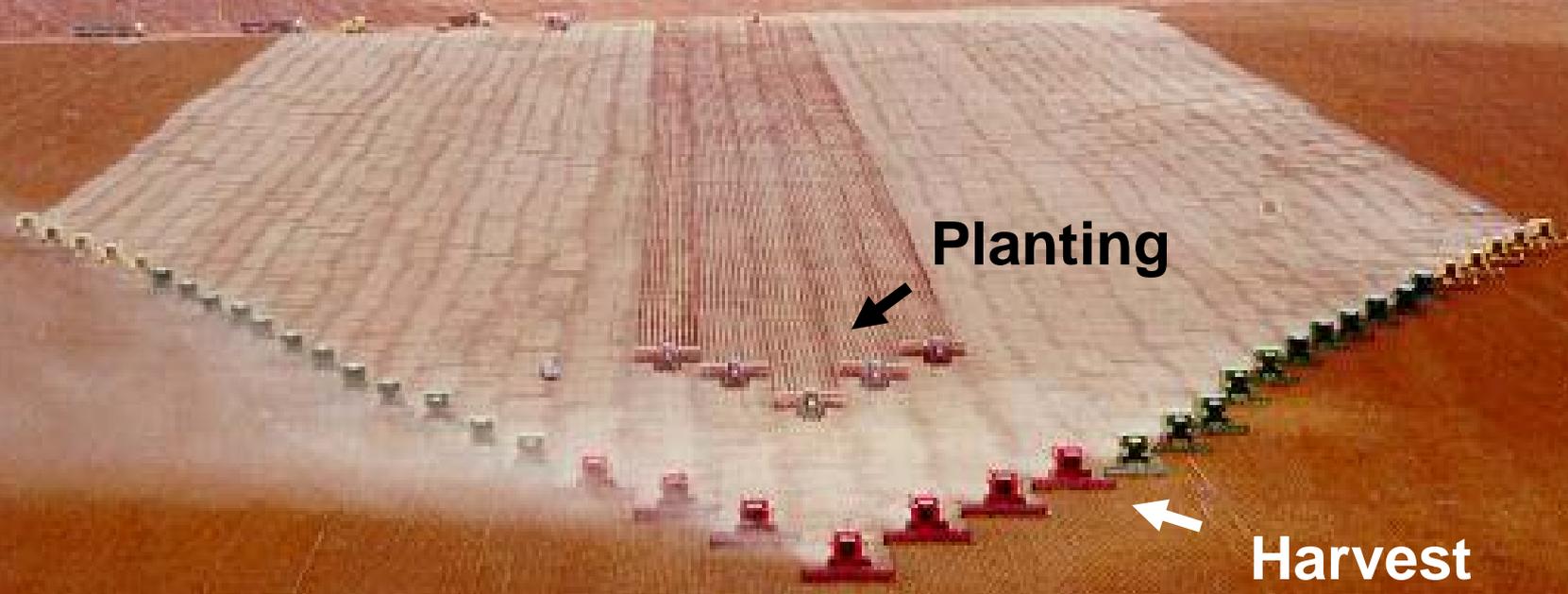
...links production with sustainability.

Conservation Agriculture worldwide 117 Million ha





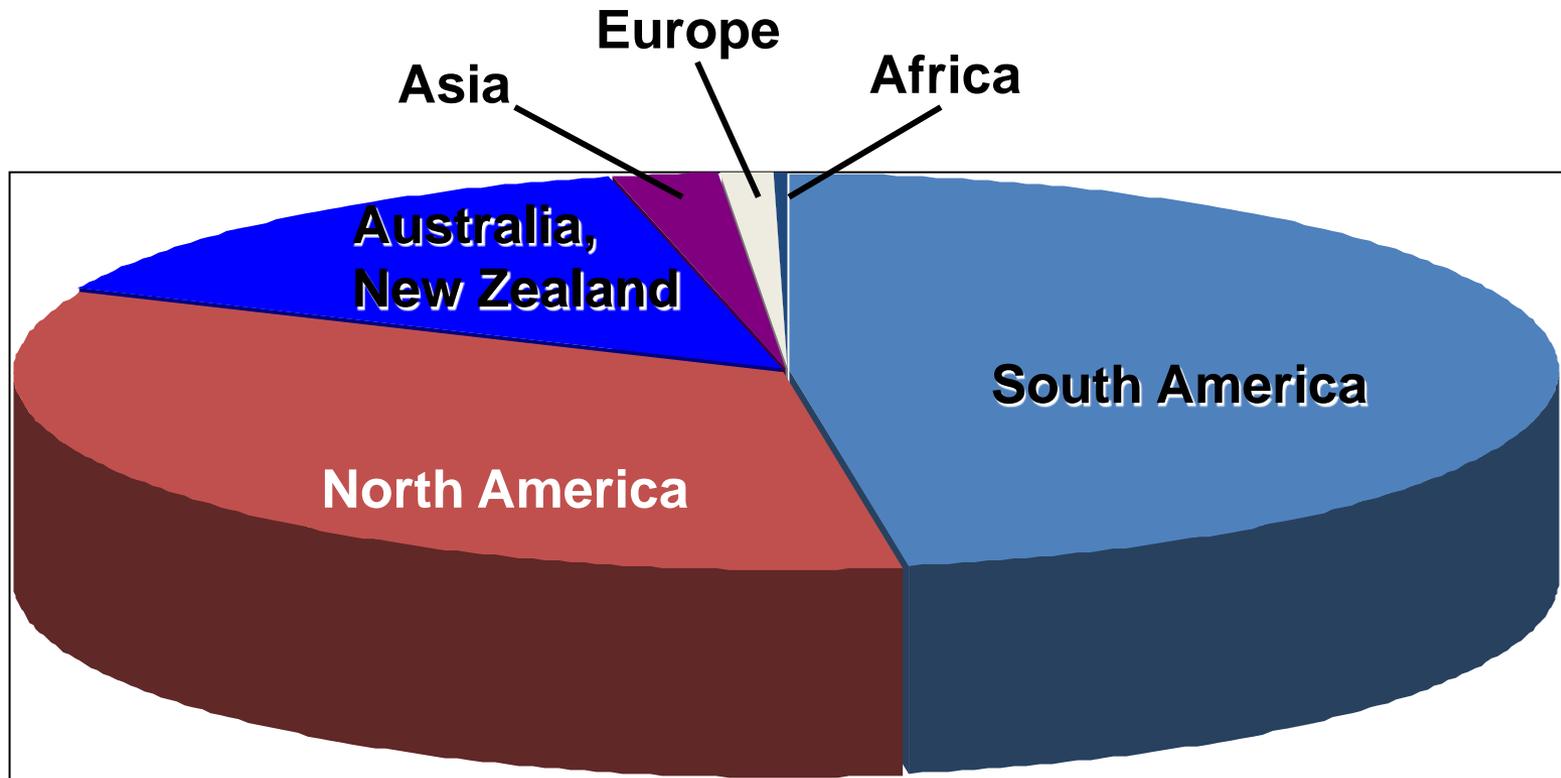
Brazil



Planting

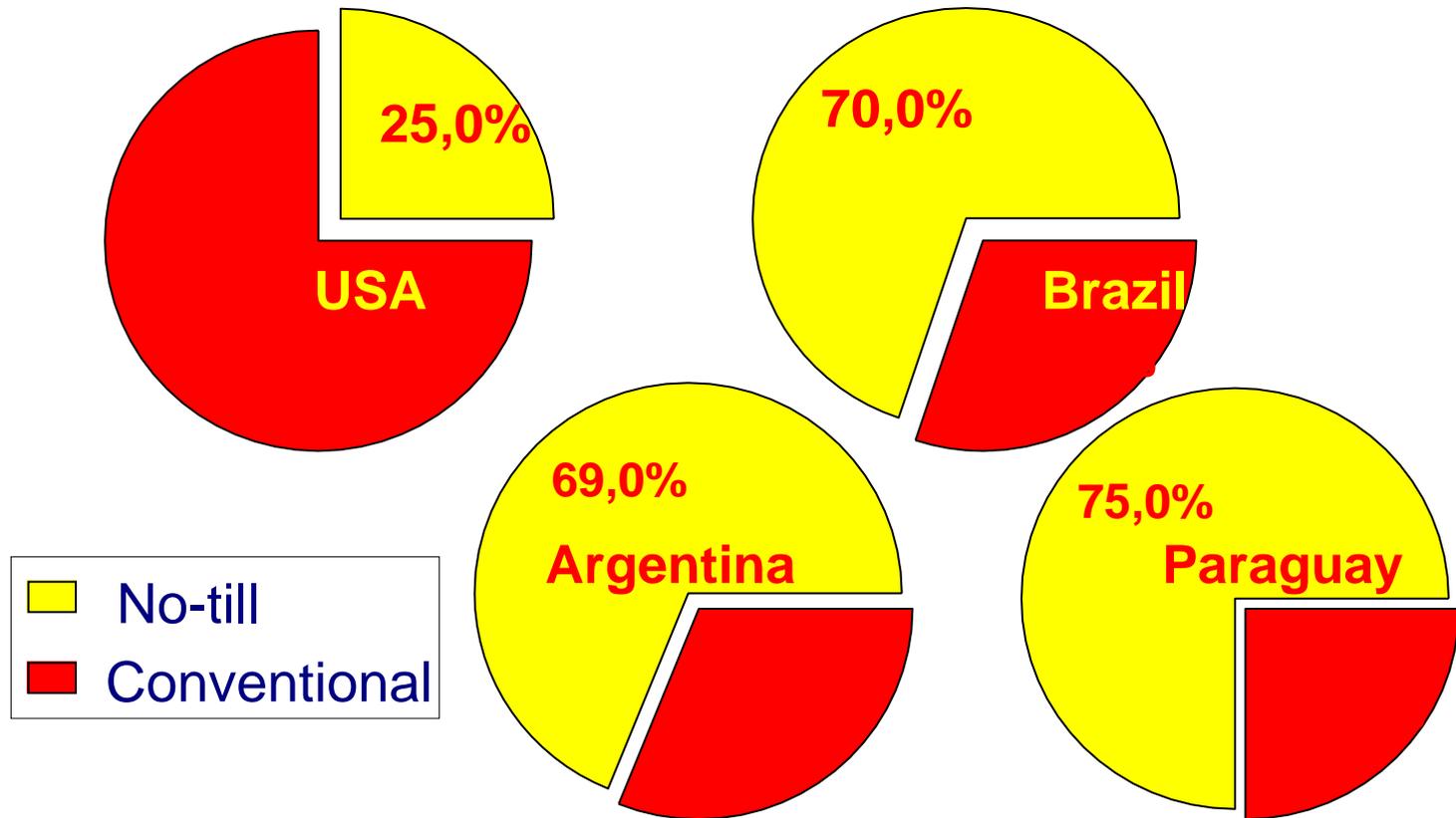
Harvest

CA Adoption in percent by region worldwide



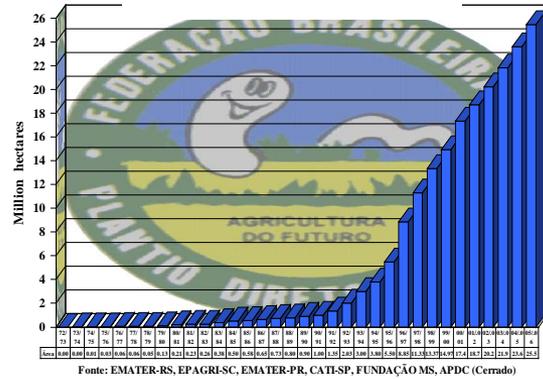


CA Adoption relative to total cropland

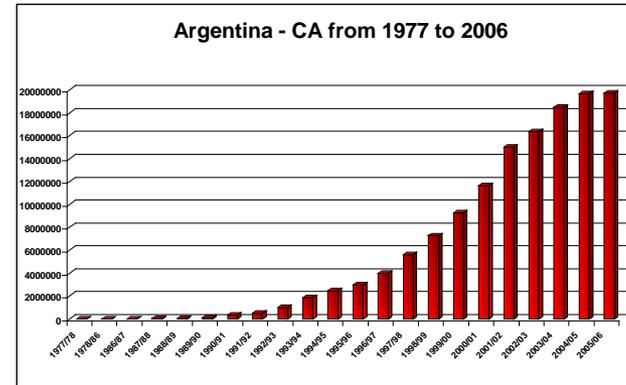


It is estimated that in less than a decade > 85% of the cultivated area will be under No-till.

Brazil - Area under CA from 1972 to 2006

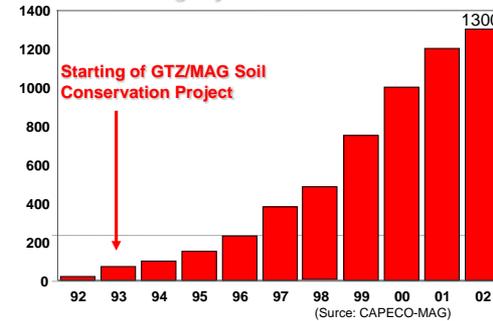


Argentina - CA from 1977 to 2006



CA globally - history and adoption

Paraguay – CA area 1992-2001



No-Till Adoption in the U.S. 1994 - 2004

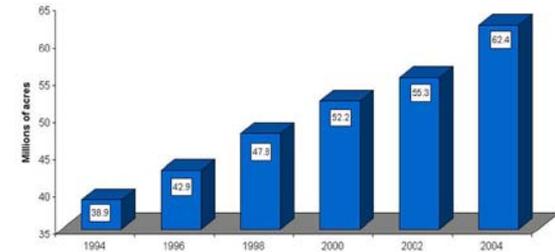
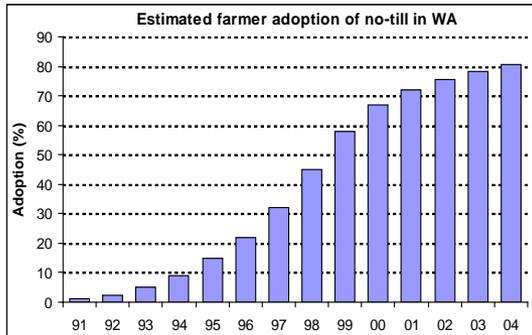
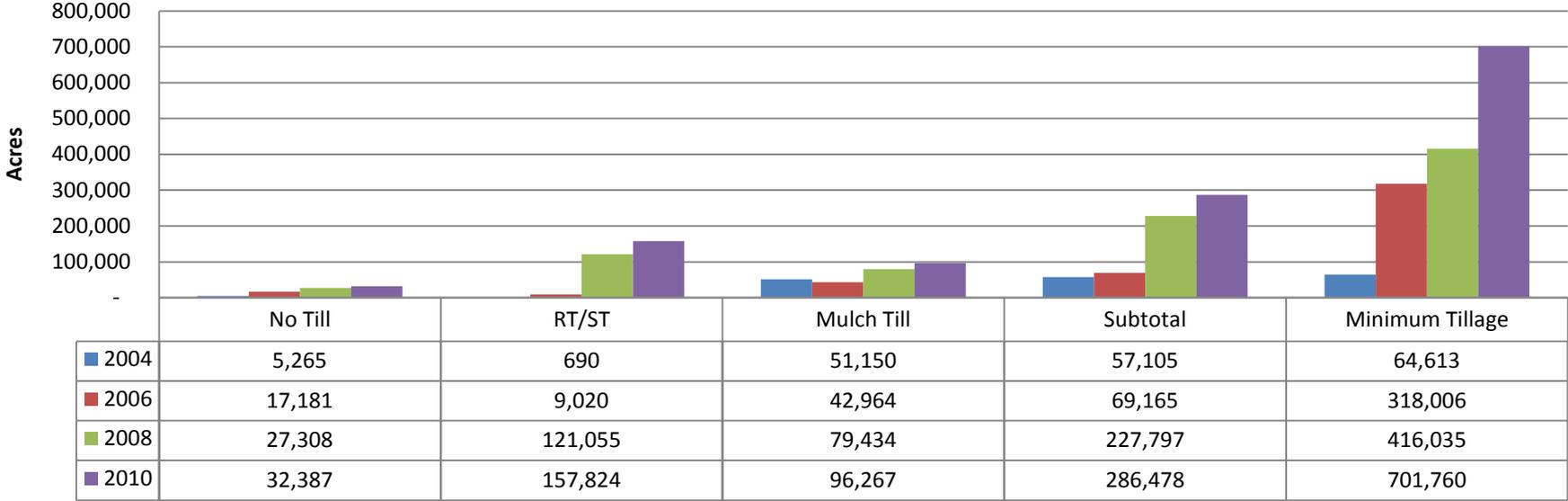


Fig. 2 No-Till Adoption in the U.S. No-till adoption continues to steadily rise. This represents almost 23 percent of the nation's cropland. Source: Conservation Technology Information Center

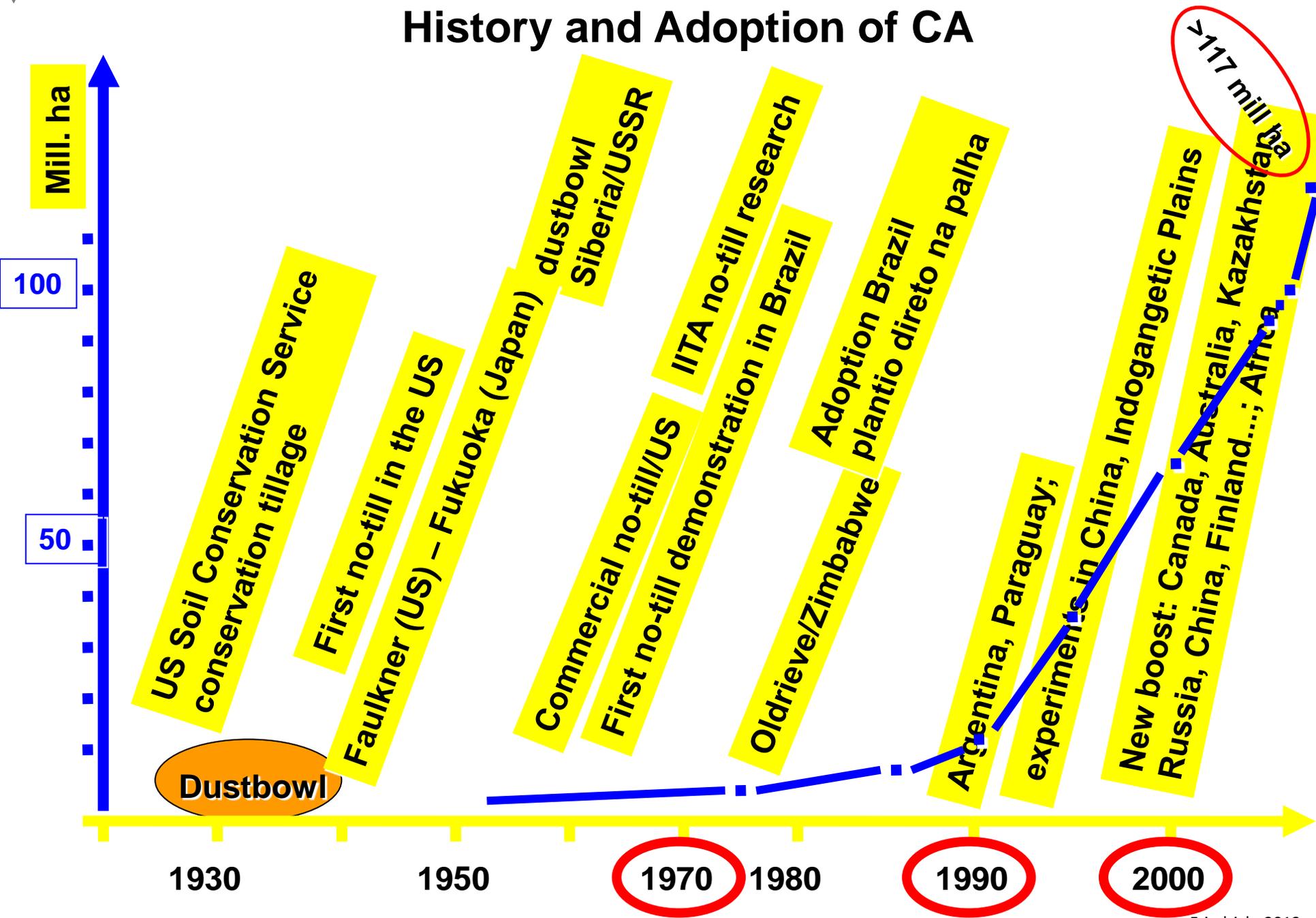




Increases in CT 2004 - 2010



History and Adoption of CA





HOME > MANAGEMENT > CALIFORNIA FARMERS SLOW TO ADOPT CONSERVATION TILLAGE

California farmers slow to adopt conservation tillage

Harry Cline Feb. 10, 2012 4:51pm

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- CT consumes less energy and labor, thereby reduces costs, reduces environmental impacts, increases soil carbon content and improves soil tilth, fertility and overall organic matter, according to CT apostles.
- California farmers are proving slow-to -reluctant to adopt Midwest-style conservation tillage (CT) farming practices.

What is in this article?:

- California farmers slow to adopt conservation tillage
- Conservation tillage discovery >
- Productivity drives sustainability >

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Dino Giacomazzi, left, Hanford, Calif., dairy farmer, was the keynote speaker of the CASI media event moderated by Bob Wample, center, Clovis, Calif., consultant, and organized by Jeff Mitchell, UC cropping system specialist.

California farmers have proven repeatedly they can be quick to adopt new technology.

GPS tractor guidance systems and the compatible variable rate technology along with drip irrigation are two cases in point.

Conservation tillage advocates contend CT offers much the same advancement as satellite directed tractors and micro irrigation systems.

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BEAT



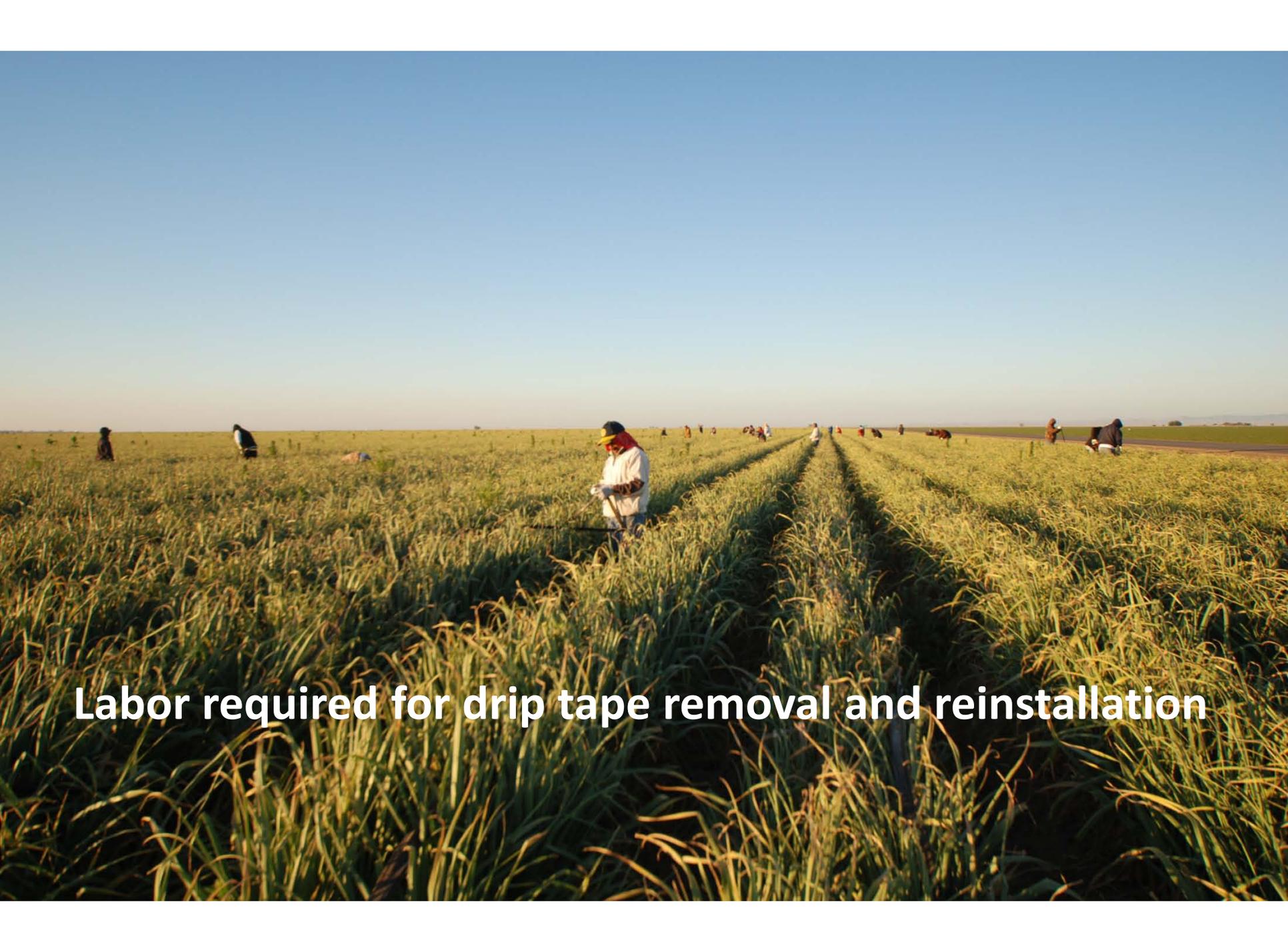
**Strip-till seeded onions in wheat cover crop
Moses Lake, WA
2010**





**Center-pivot mechanized irrigation is used.
Moses Lake, WA
2010**





Labor required for drip tape removal and reinstallation

Our experimental context and field set-up







Eight seed lines across a 60" bed







Establishment with overhead irrigation





A large center pivot irrigation system is shown over a field of green onions. The system consists of a long metal structure supported by a series of towers, with multiple wheels at the end of each tower. The structure is supported by a network of cables and pipes. The field is filled with rows of green onions, and the irrigation system is actively watering them, with mist visible in the air. The sky is clear and blue.

**Commercial state-of-the-art dehydrator onion field
under center pivot irrigation
Five Points, CA
2011**

Irrigation Amounts

- Overhead 14.1 inches
- Drip 13.6 inches

March – June 2011







Evidence of actual production



**Commercial scale and equipment harvesting
Five Points, CA
August 2011**





**Strip-tilling ahead of following transplanted broccoli crop
Five Points, CA
2011**



Onion Plant Populations

- OVERHEAD 49 / m²
- DRIP 33 / m²

The effect of irrigation on plant population was significant ($P = 0.02$).

There were no effects of tillage or interactions between irrigation and tillage.

There was no effect of irrigation or tillage on onion sizes.

- Small < 5.7 cm
- Medium < 6.2 cm
- Large < 7.2 cm
- X-Large < 8.4 cm
- XX-Large < 9.8 cm

Onion Yields 2010 - 2011

- Drip 29.3 tons/ac
- Overhead 37.3 tons/ac ($P = 0.04$)
- No effect of tillage
- No interactions between irrigation and tillage

Conclusions and next steps

- Figure in all costs
- Improve production practices
- Figure out seeding operations
- Is residue a problem in harvesting?
- The goal is increased competitiveness with sustainability.

