Alternative Crops in Western Nevada

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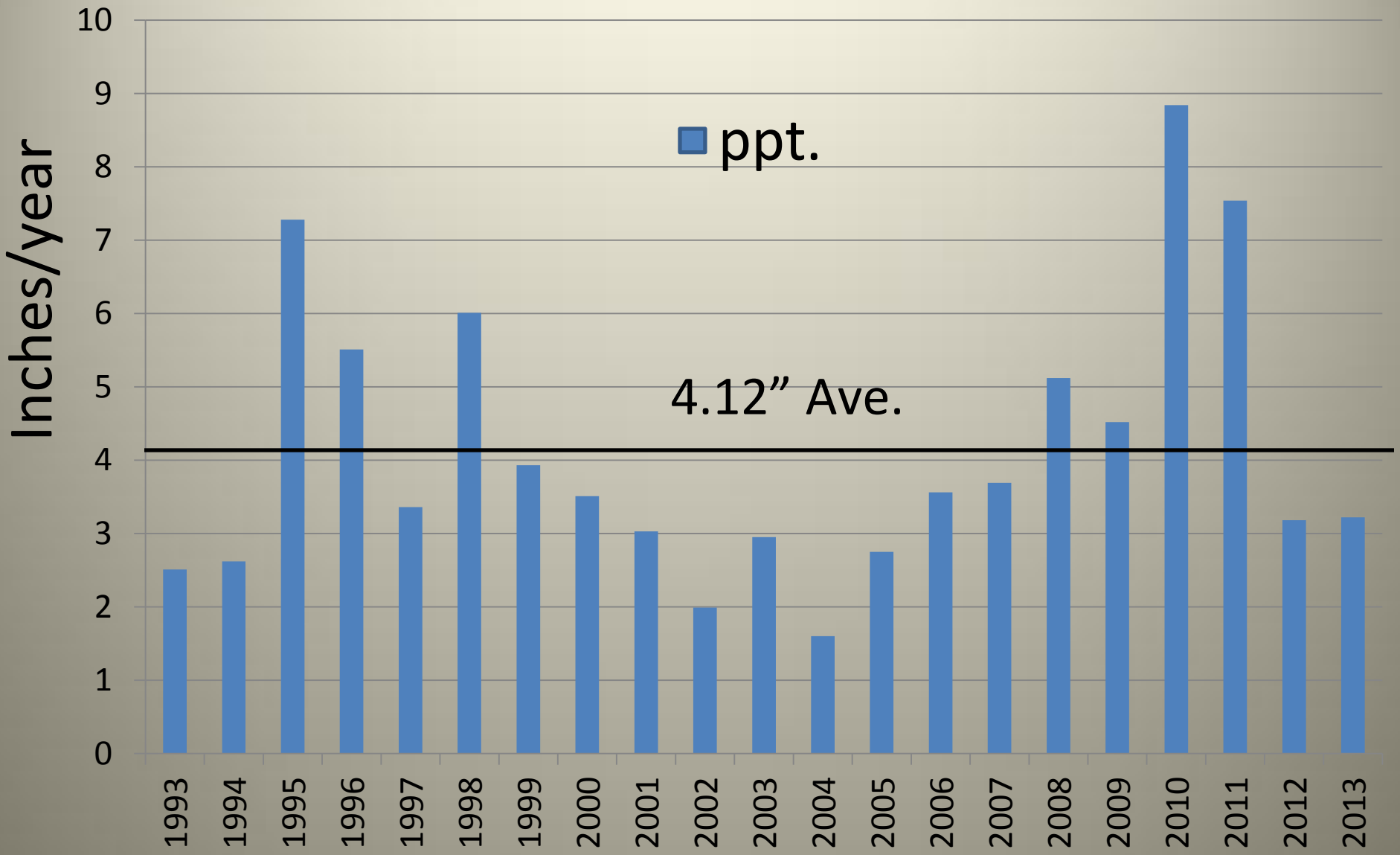
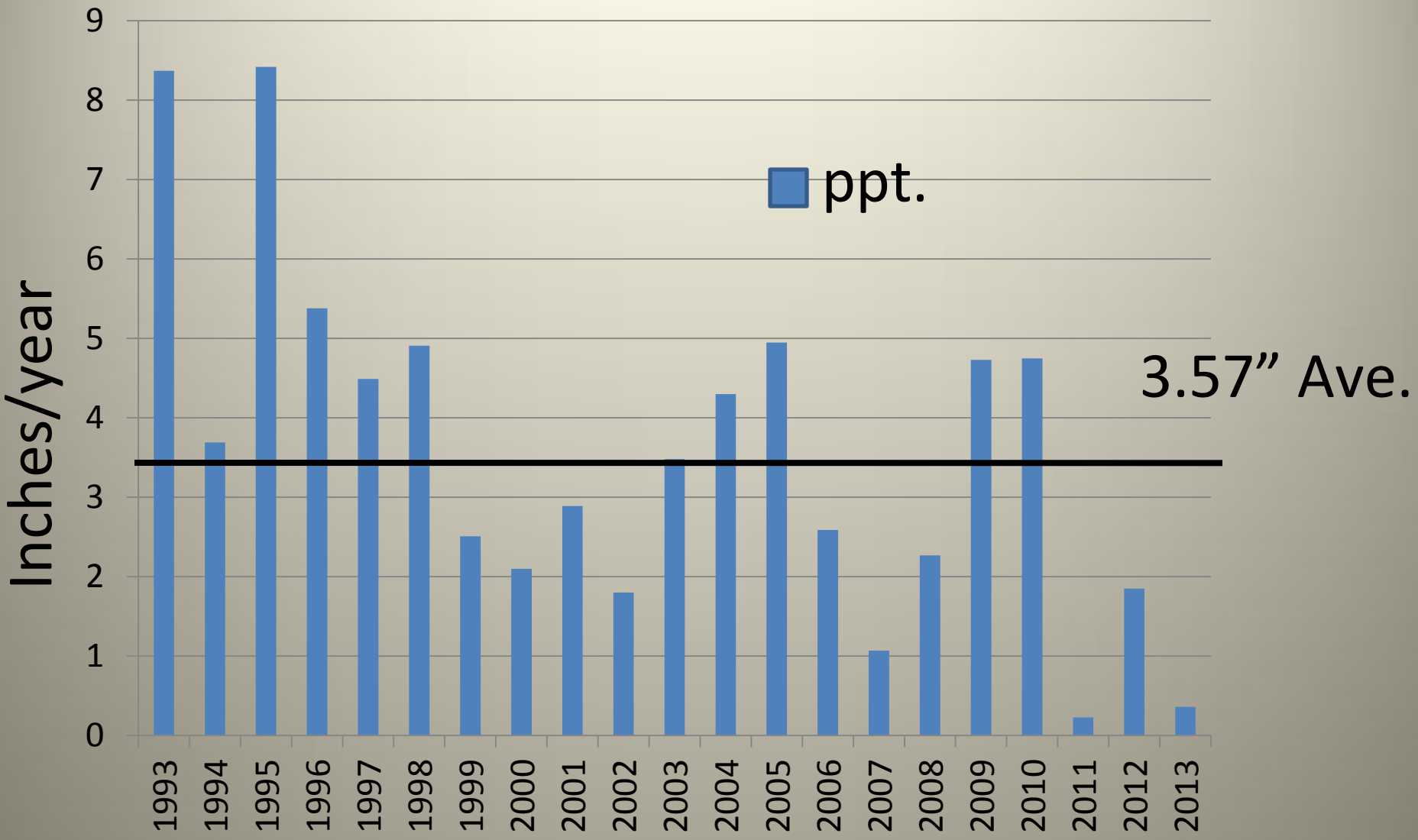
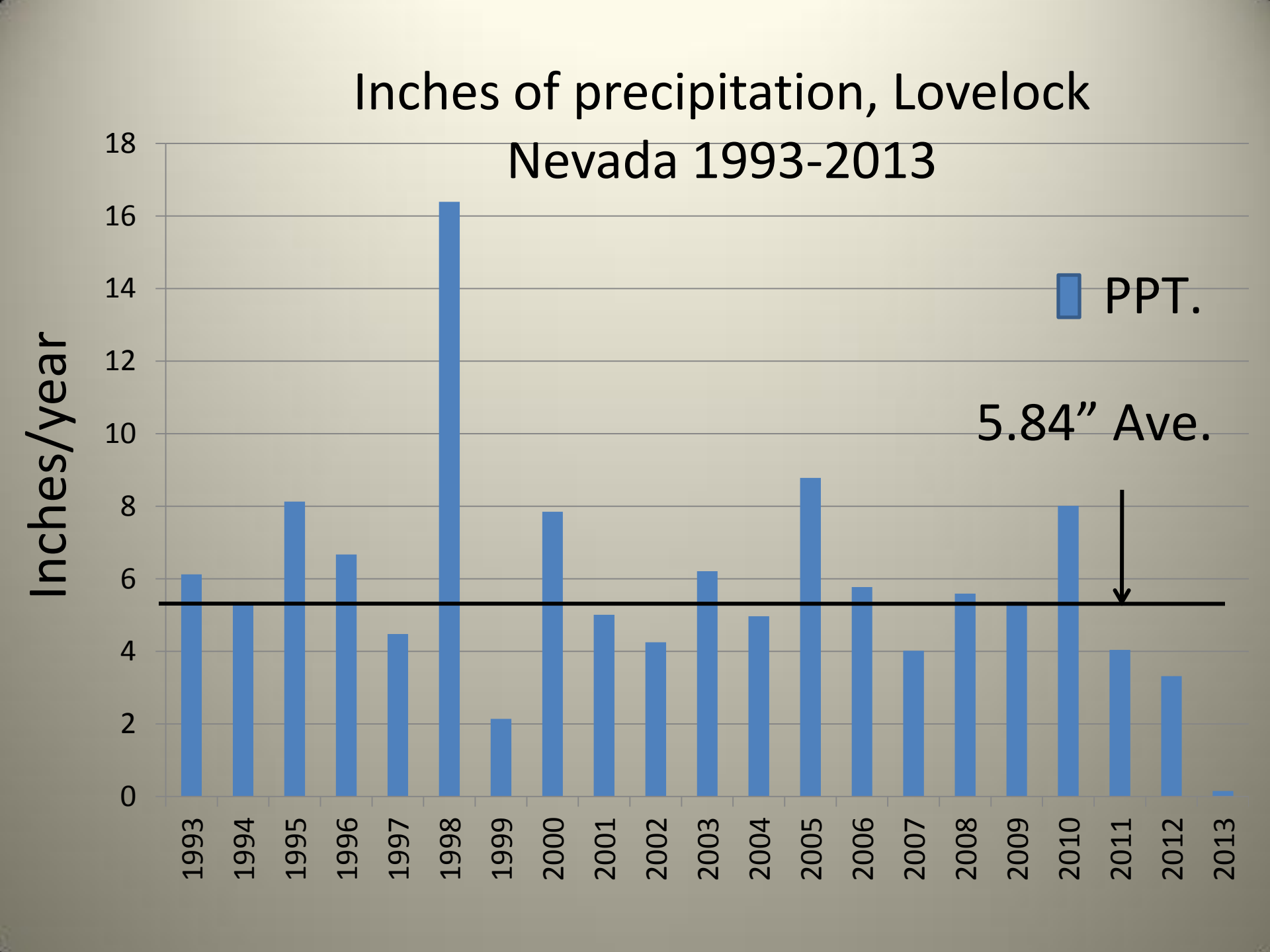
What About Dryland Crop Production?

Inches of precipitation in the Lahontan Valley 1993-2013



Inches of precipitation in Mason Valley 1993-2013




Inches of precipitation, Lovelock Nevada 1993-2013
Inches/year
18
16
14
12
10
8
6
4
2
0
PPT.
5.84” Ave.
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013

Dryland Farming is Impossible in Nevada

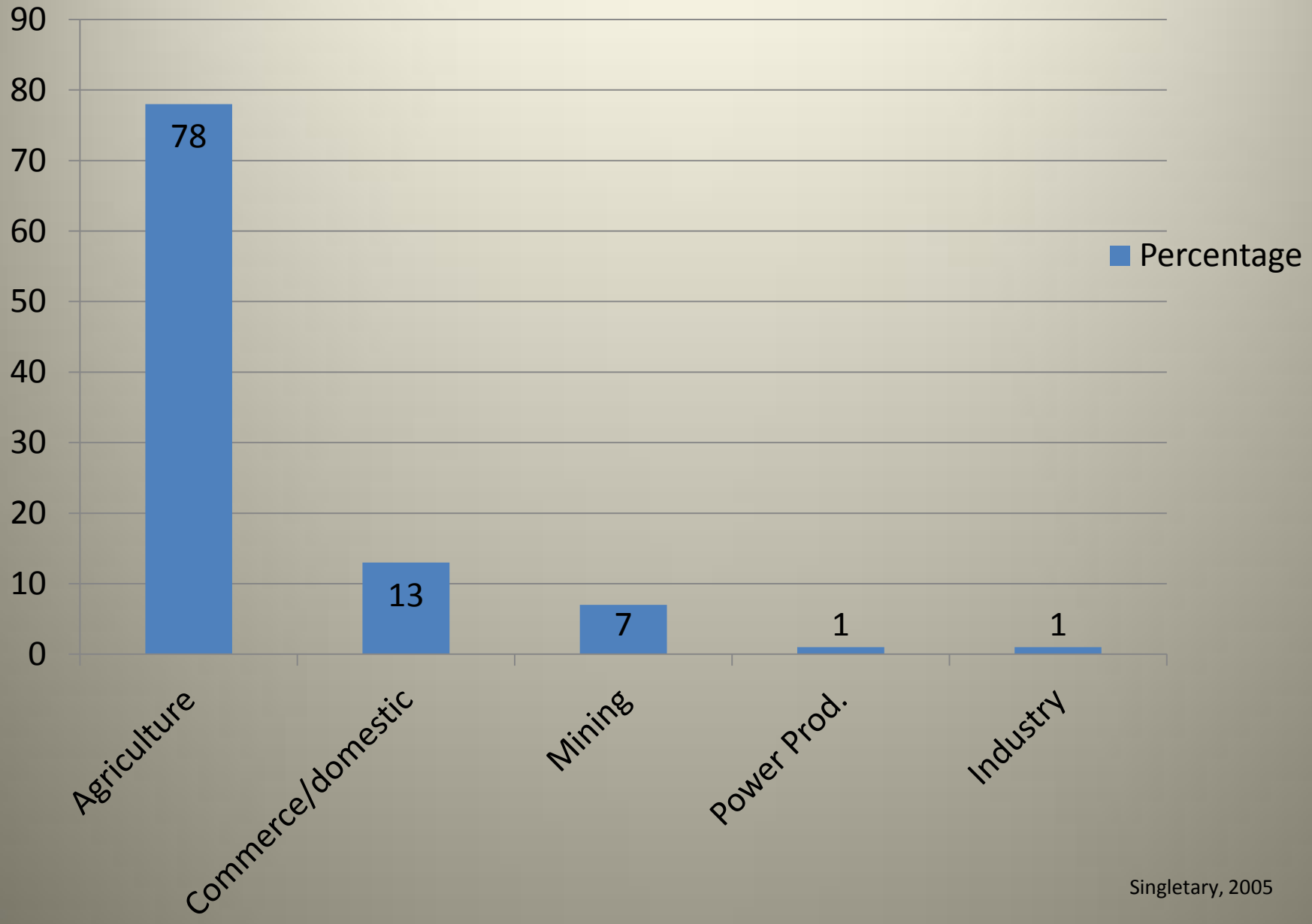
(irrigation is required for all crops)

During the vast majority of the last 20 years precipitation and irrigation water stored in local reservoirs has been below the long term average in Western Nevada.

We are the driest state in the nation and should not expect a long term increase in water supplies.

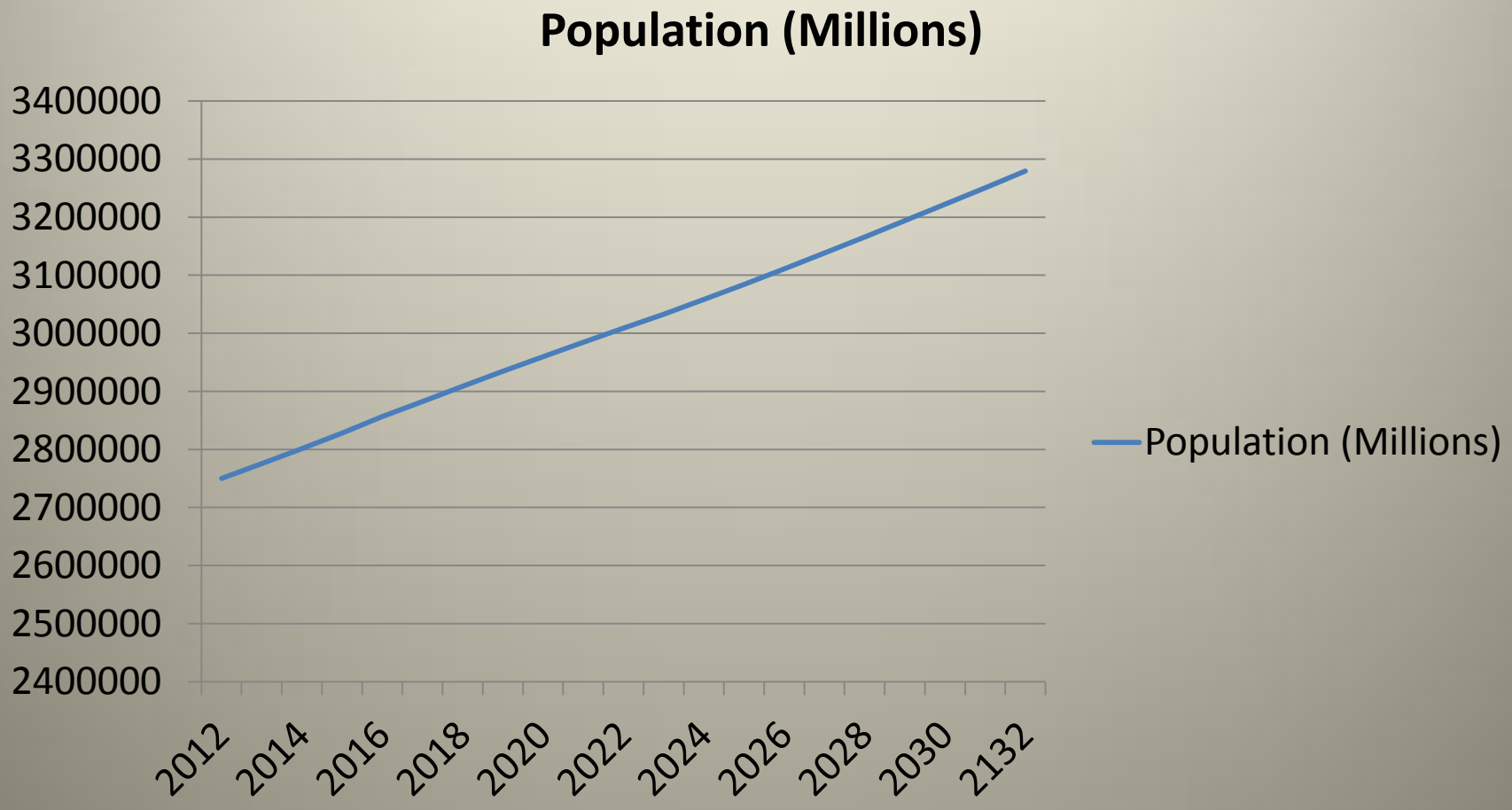
Why Alternative Crops in Nevada?

Water use in Nevada



Singletary, 2005

Nevada's Projected Population Increase 2012-2032



*Nevada State Demographer's Office 2013

Due to climate, politics and economic realities, water in Nevada will continue to be transferred from agricultural uses to urban and environmental interests as the population in the state expands.

Crop Production in Nevada:

100% of cropland in Nevada is irrigated & most of the land in Nevada (92%) is used to produce hay (alfalfa- grass hay)

Average annual irrigation applications for alfalfa in W. Nevada ~48”acre

Need Alternative Crops that:

- Use less water than forages
- Produce equivalent incomes for producers as alfalfa
- Provide crop diversity

Alternative Crops Evaluations 1998-2013

- Switchgrass
- Bermuda grass
- Soybeans
- Poplar Trees
- Millets
- Nursery Stock (trees, shrubs, grasses)
- Wine grapes
- Gluten free grains (amaranth, pearl millet, buckwheat)
- Malting barley
- Seaberries
- Biofuels (perennial warm & cool season grasses)
- Teff
- Canola (Winter & Spring)
- Guar
- Sorghum
- Sorghum-Sudangrass
- Sudangrass
- Native seeds

Why Teff?

- Similar to current production practices
- Non-gluten grain
- Large water savings
- Excellent double/rotation crop
- Short season, summer forage alternative

Teff

- *Eragrostis tef*
- Warm season annual grass (not cold tolerant)
- Seeds (flour) used for injera (flat bread) in Ethiopia & major U.S. cities
- Gluten free grain
- Adapted to Western Nevada

Teff Irrigation Recommendations

Norberg, Roseberg Charlton, and Shock 2009	12-30”/year
Miller 2010	Minimum 24”/year
Davison 2010	24-30”/year


Teff

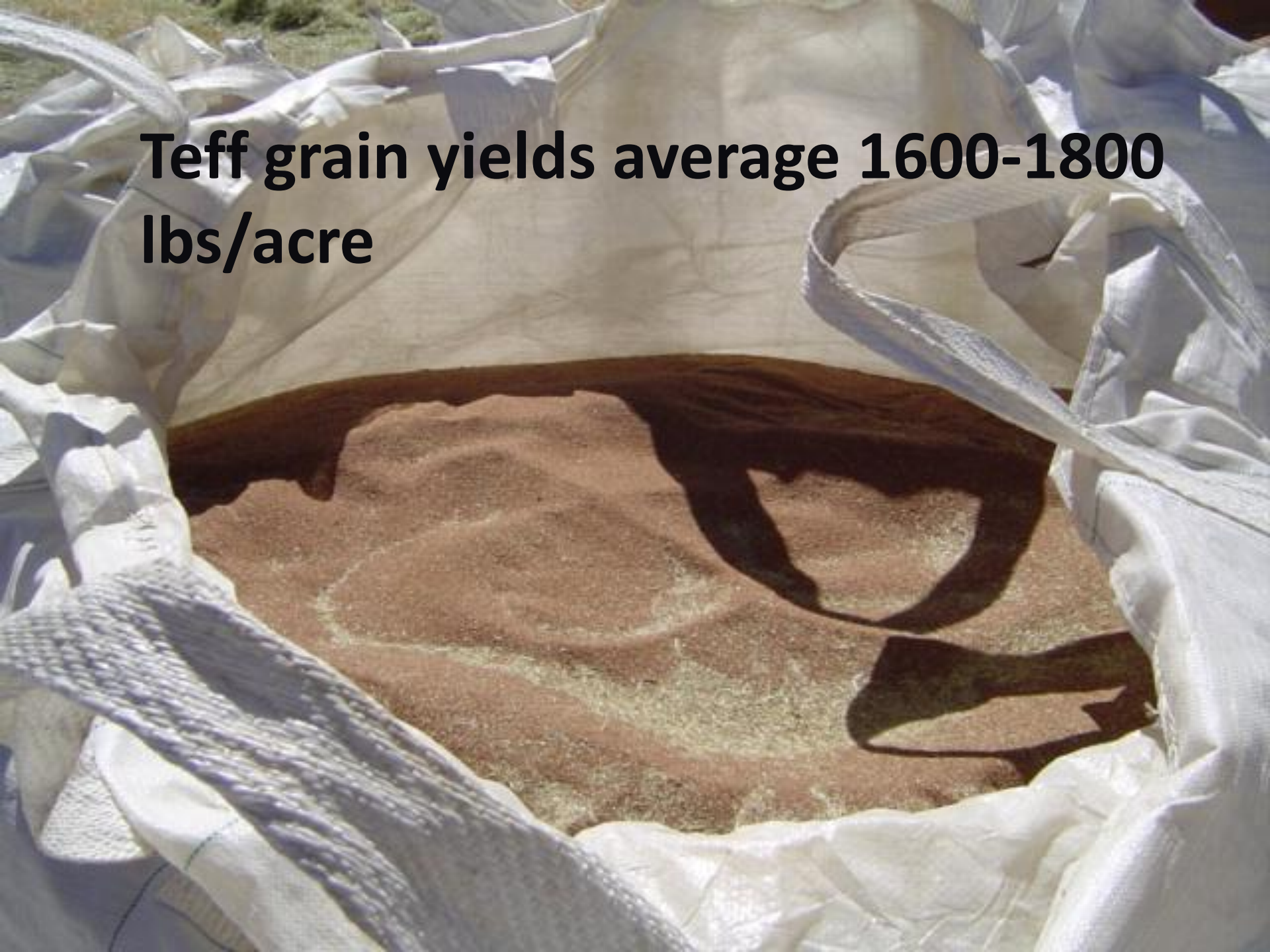
Teff in the Walker Basin

Teff Grain Field

Teff Field after Swathing/Windrowing


Teff Windrows Ready
for Combining

Combine with Pick-up Belt and Custom Screens


Teff grain yields average 1600-1800 lbs/acre

Teff Straw 2-3 tons/acre

Teff Results 2013

- Grain Yields

Nevada produced approximately

1,300,000 lbs in 2013 @ $.45-.50/lb to farmers

Fodder

3000 tons @ $120-160/ton

Teff Grain Economics

Income

Grain 1800 lbs/acre X $.45= $810/acre
Fodder 2.5 tons/acre X $130.00/ton= $325/acre

Total = $1135/ acre

Direct Costs

Land prep, seeding, fertilizer= $172.00/acre
Irrigation, weed control= $66.00/acre
Harvest grain, bale and remove fodder = $82.00

Total= $320.00

Profit

$815/acre

Advantages to Teff Production

- Low input costs as compared to other rotation crops.
- Similar to existing production systems.
- High potential returns from grain + fodder.
- Uses half to 2/3rds as much water as other common crops.