Adjusting Alfalfa Cutting Schedules for Economic Conditions

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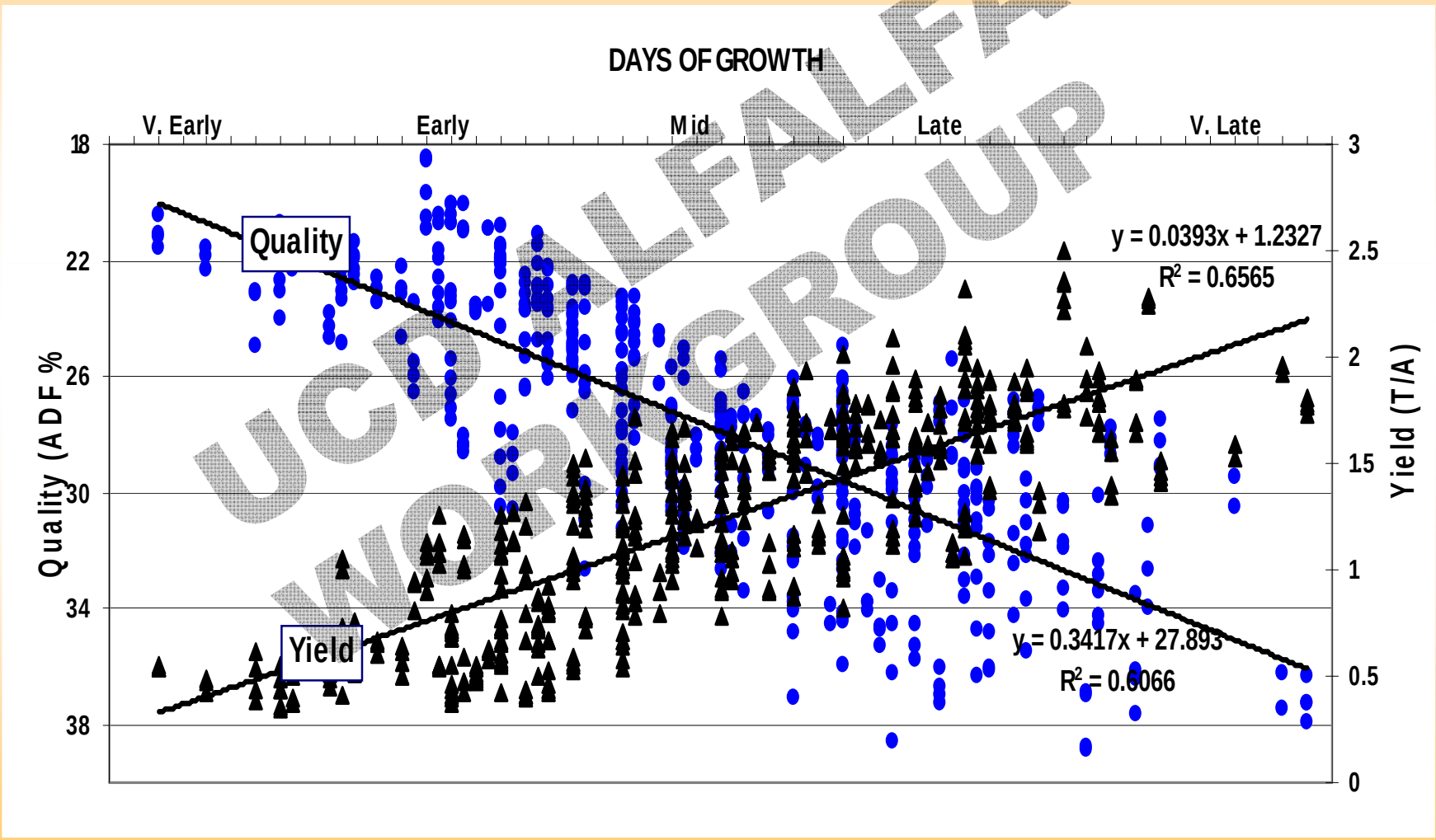
YIELD-QUALITY TRADEOFF

(Yolo County, all harvests, 1999-2000)



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Harvest timing most powerful tool under the grower's control to determine both yield and quality.

- Alfalfa cut at pre-bud or early bud has high forage quality but yield suffers.
- Conversely, alfalfa cut in bloom stage is higher yielding but lower forage quality—typically too low to meet dairy-quality standards for milking cows.

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Solution to Yield/Quality Tradeoff

- Although genetic solutions have been proposed to this quandary, the **Yield/Quality Tradeoff** is largely unavoidable and presents a real challenge for the alfalfa producer.
- *Is it more profitable to aim for high quality or to sacrifice some quality for higher yield?*
- This can be a perplexing decision given the dynamic nature of the alfalfa market.

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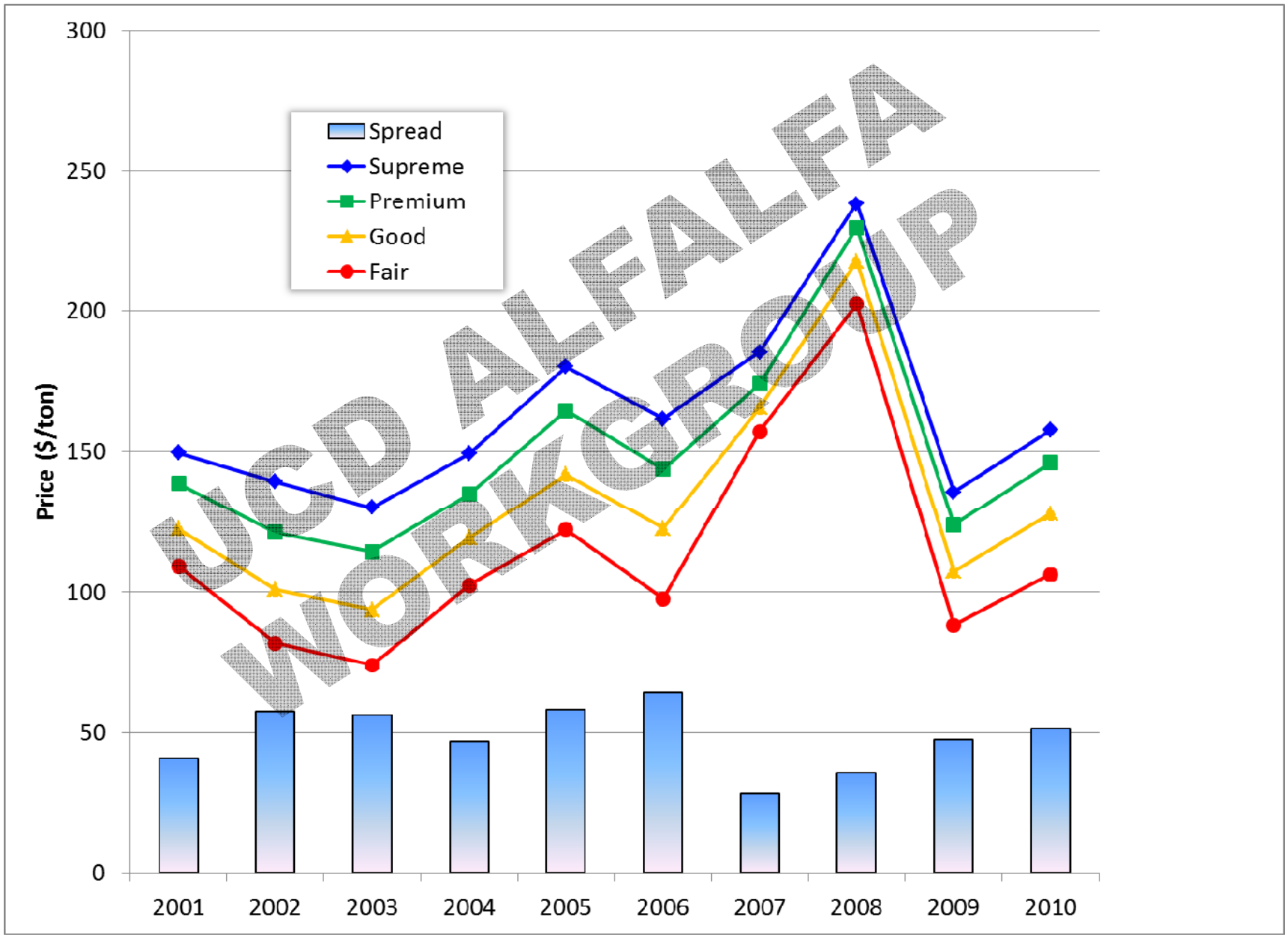
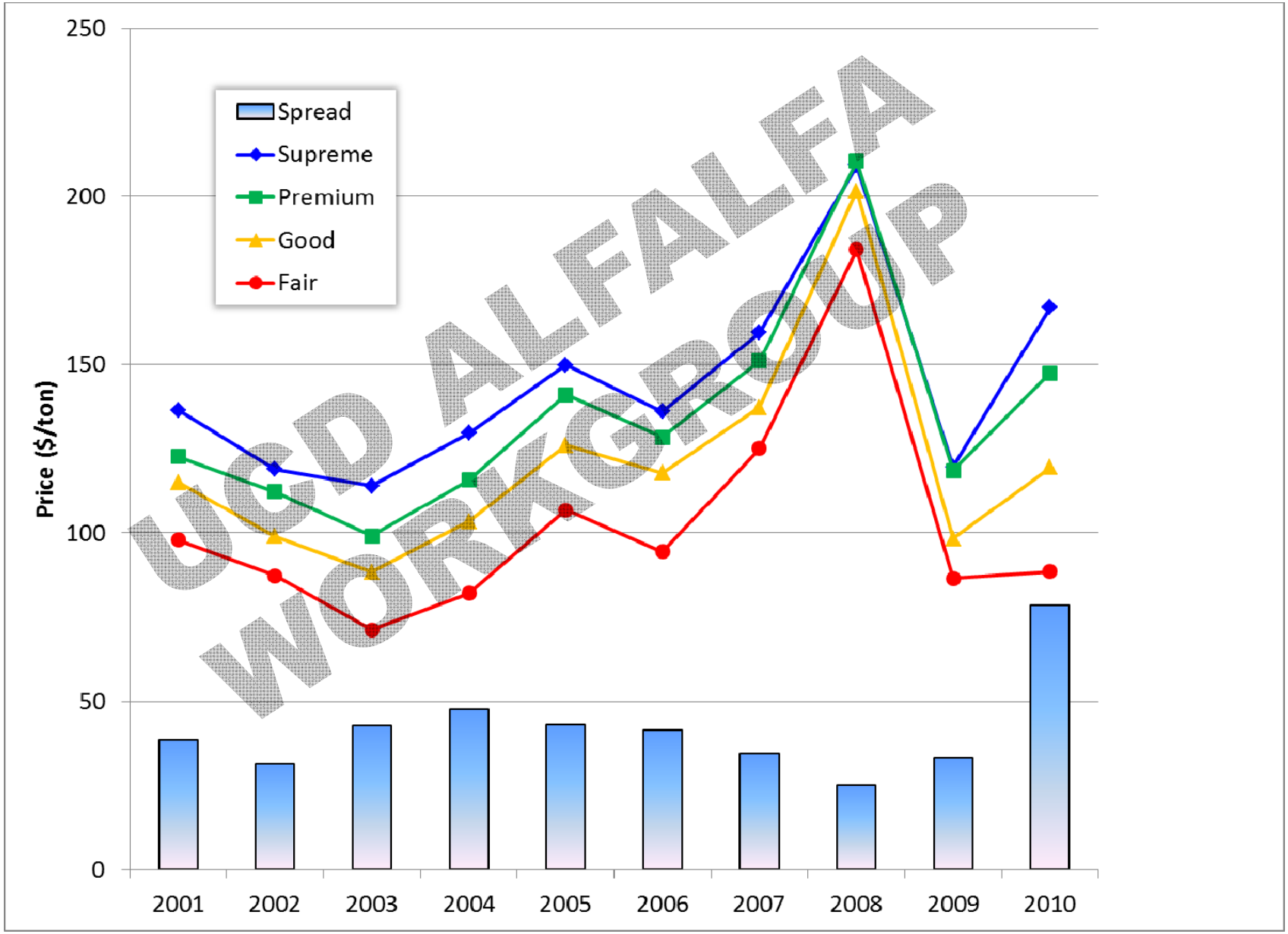
Average Annual Alfalfa Hay Price—Central Valley



Average Annual Alfalfa Hay Price--Intermountain Area



Economics of Cutting Strategy

- Research conducted in CA & other states to quantify rate of yield increase and quality decrease for different cuttings.
- Can help with the decision of the appropriate cutting frequency to maximize profits.
- Shortcoming of this approach is that the overall optimum cutting schedule for a season cannot be determined by evaluating a single cutting in isolation.
- Preferred approach is to examine the economic consequences of different cutting schedules over the entire season

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Season-Long Cutting Schedule Research

- Research was conducted in CV and IM areas of California to determine the effect of different cutting strategies on yield and quality.
- 6 – 8 cuttings common in CV
- Trial conducted over 3 years (2002-2004) in Davis, CA, typically 7 cuts at around 28 day intervals
- Compared with a more aggressive cutting schedule (cut every 24 – 26 days for a total of 8 cutting per year, and less frequent cutting interval (32 to 33 day cutting interval) with six cuttings per year.

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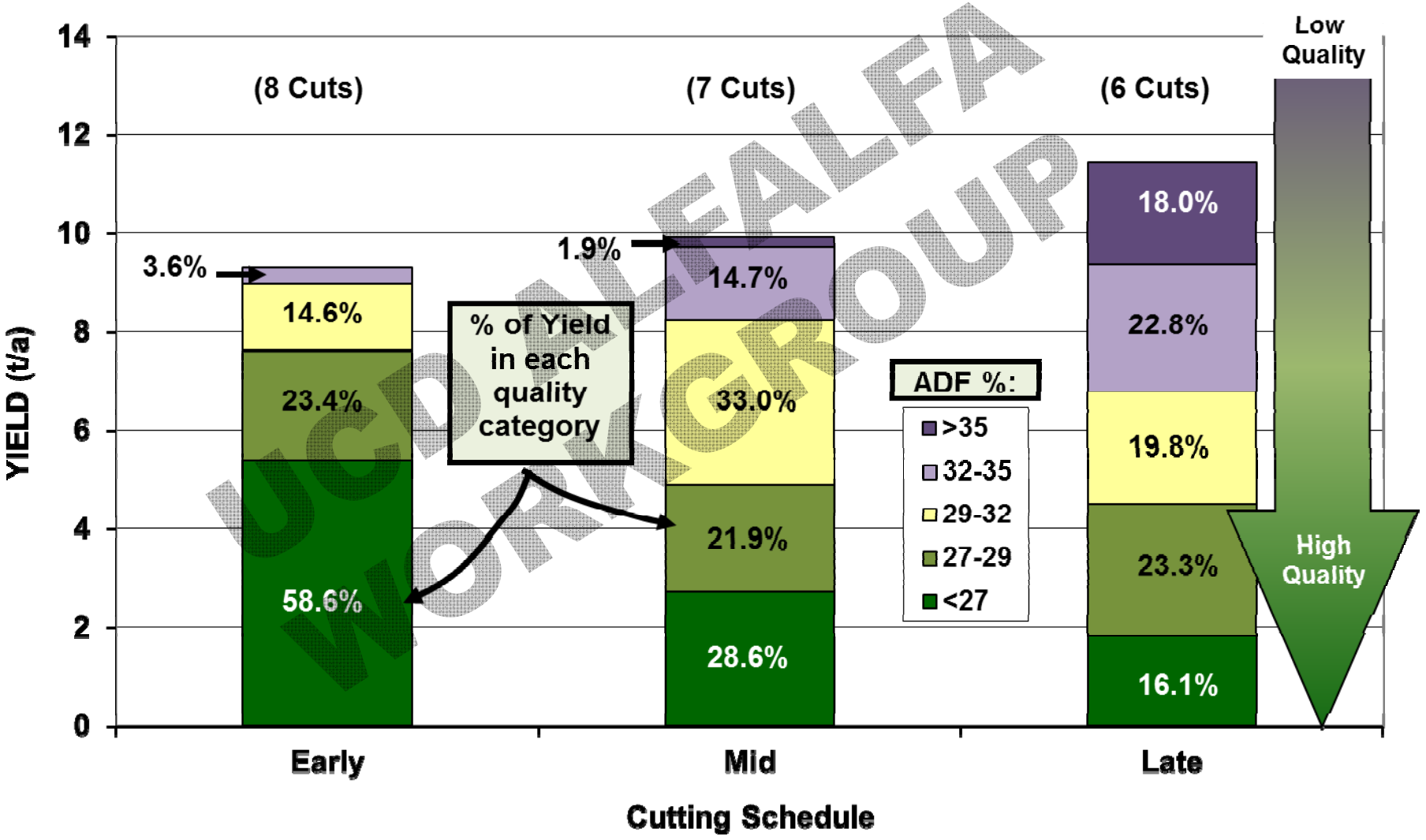
The Effect of Cutting Schedule on Yield and Quality

Davis, CA 2002 – 2004



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Season-Long Cutting Schedule Research IM

- Only 3 – 4 cuttings common in the IM area due to the cooler weather and shorter growing season.
- Compared yield and quality for 3- and 4-cut schedules in the Klamath Basin (4,000 ft.) and a cooler location, Butte Valley (4200 ft. elevation)
- Two variations of 3-cut system
  - 3-cut schedule with approximately equal intervals between the second and third cuttings.
  - 3-cut schedule where 2nd cutting was delayed a week to ten days to maximize production at that time of year.

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2001-2004 IREC Tulelake

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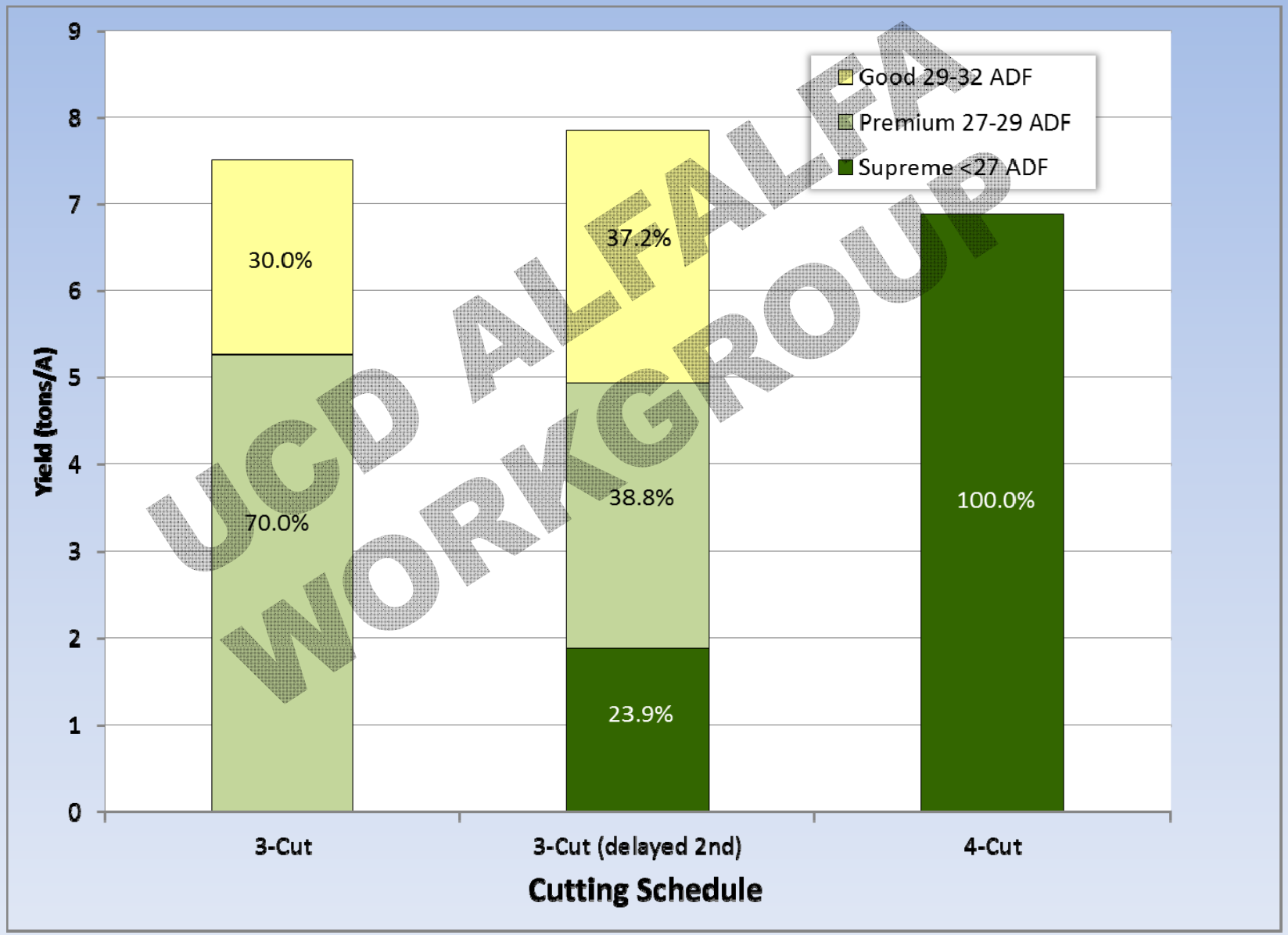
2002 Butte Valley Grower Cooperator

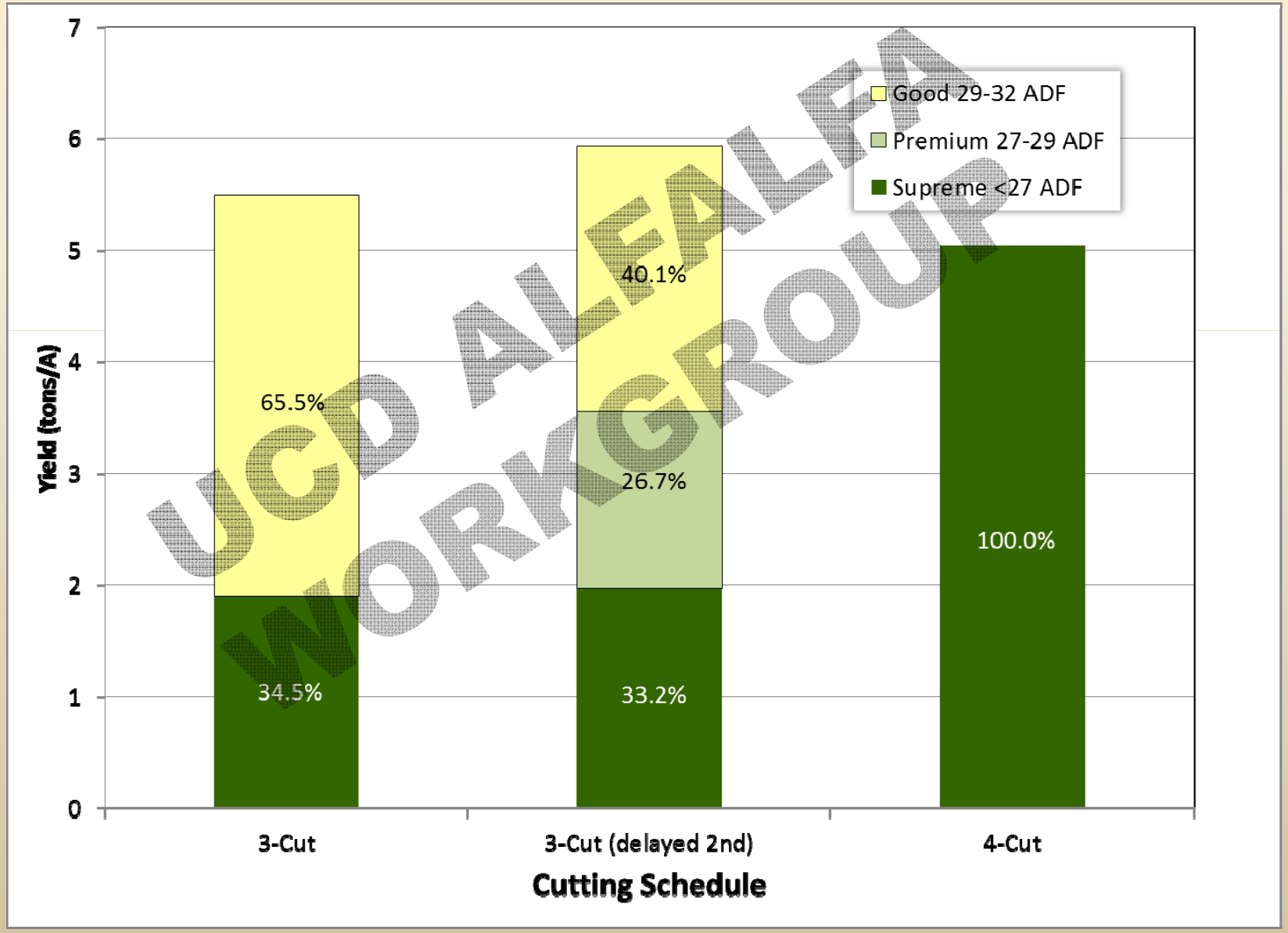
The Effect of Cutting Schedule on Yield and Quality

Tulelake, CA



The Effect of Cutting Schedule on Yield and Quality

Macdoel, CA



Cutting Schedule Effects on Gross Returns

- Gross returns for each of last 10 yrs. calculated by multiplying yield associated with each cutting schedule by the corresponding price for that hay-quality category.
- Categories were per the guidelines developed by the USDA-Market News
- Price data collected for the last 10 years (2001-2010) using the USDA Agricultural Marketing Service Livestock & Grain Market News reports.
- CV data pooled over several reporting districts

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Harvest Costs

- Changing number of cuttings/year obviously impacts harvest costs
- Study by Blank *et al* showed costs more influenced by acreage harvested than yield per acre.
- **IM Area:** assumed harvest costs in the to be $37.80/acre per cutting for the higher yielding 3-cut schedule and $33.25/acre for 4-cut schedule.
- The study above indicated that CV growers believed overall yield had little effect on harvest costs, perhaps because yield does not vary as much in CV as it does in the Intermountain area.
- CV: assumed a harvest cost of $32 per acre for all harvest scenarios.

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Shortcomings or Flaws

- Assigned a discrete price per ton based on the quality grade of the alfalfa. *(27.2 ADF vs. 28.8 ADF both Premium)*
- Difficult to assign price to higher ADF (lower TDN) hay.
- Hay not classified as "dairy quality" (*Premium or Supreme*) is typically not bought and sold based solely on its ADF value.
- Other physical characteristics such as color, "weediness", rain damage, presence of mold, etc. become more important with these high-fiber hays.
- Very limited data for alfalfa hay in the *Utility* category (ADF greater than 35 percent)
- To develop a discount for rank high fiber hay, used the price difference between *Good* and *Fair* quality hay and divided it in half assuming as long as it was not weedy or moldy it would not incur the full discount.

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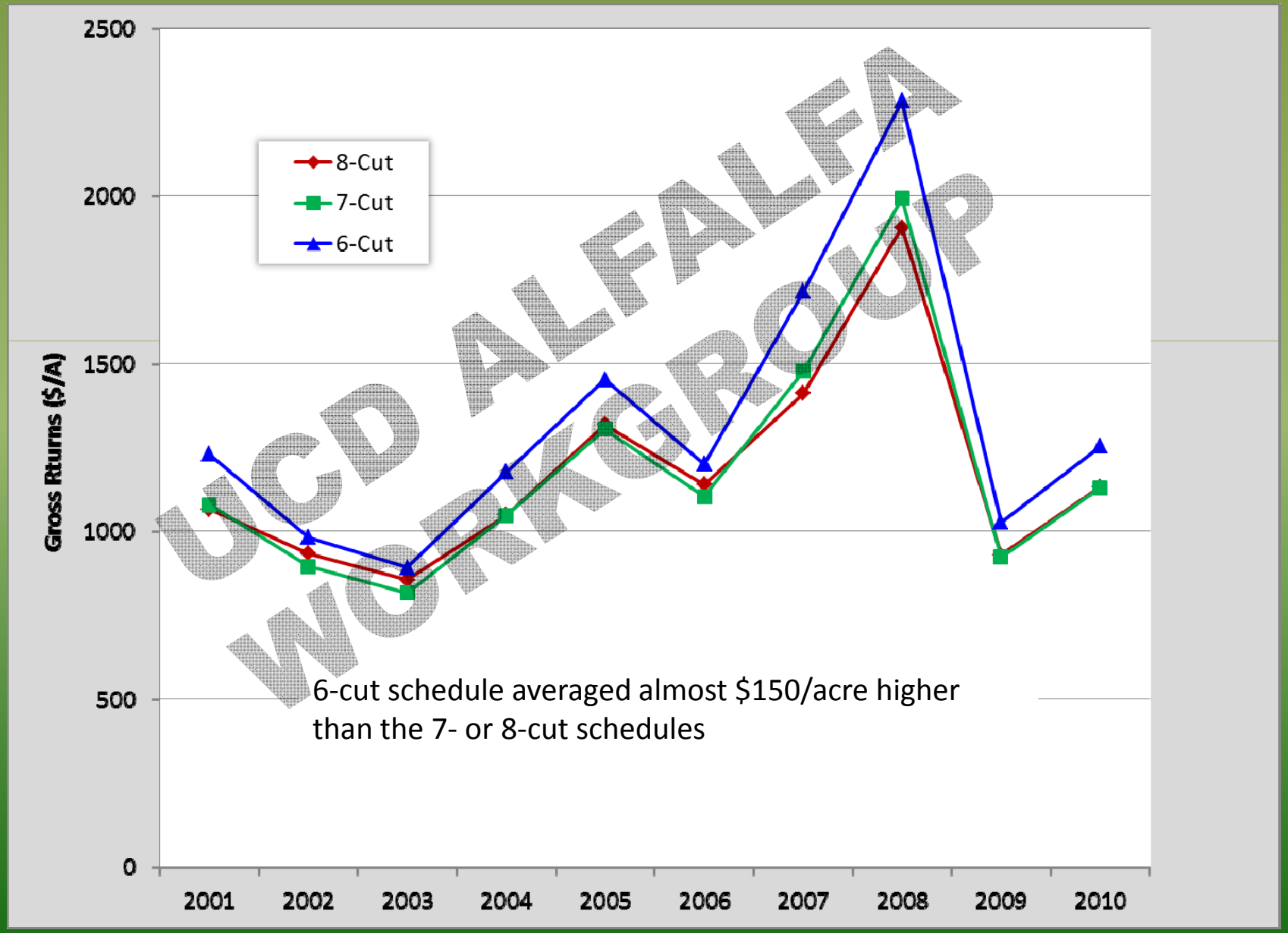
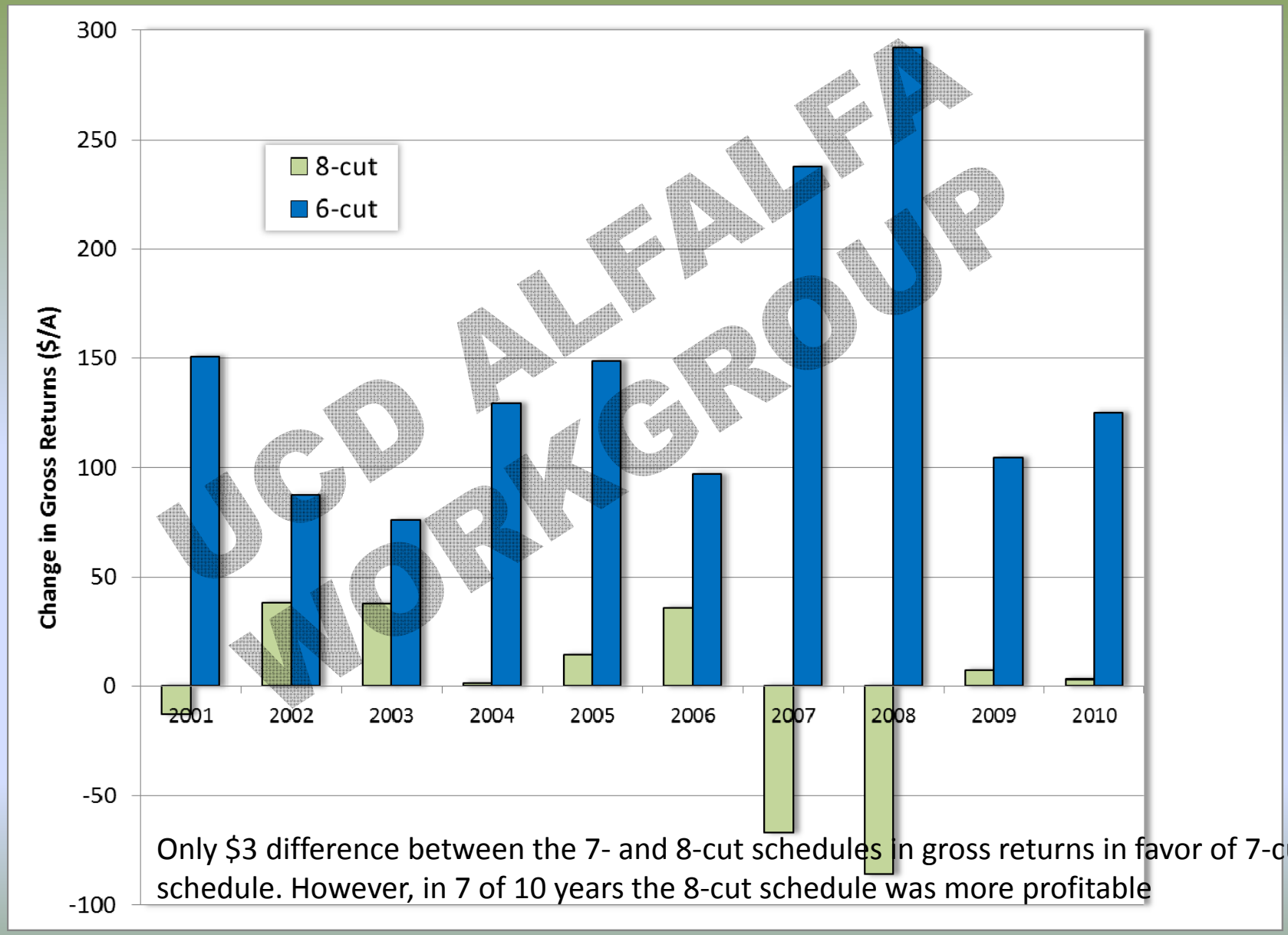
The Effect of Cutting Schedule on Gross Returns
Davis, CA



6-cut schedule averaged almost $150/acre higher than the 7- or 8-cut schedules

Difference in gross returns for a 6-cut schedule 6 and an 8-cut schedule compared with a standard 7-cut schedule. Davis, CA



Only $3 difference between the 7- and 8-cut schedules in gross returns in favor of 7-cut schedule. However, in 7 of 10 years the 8-cut schedule was more profitable

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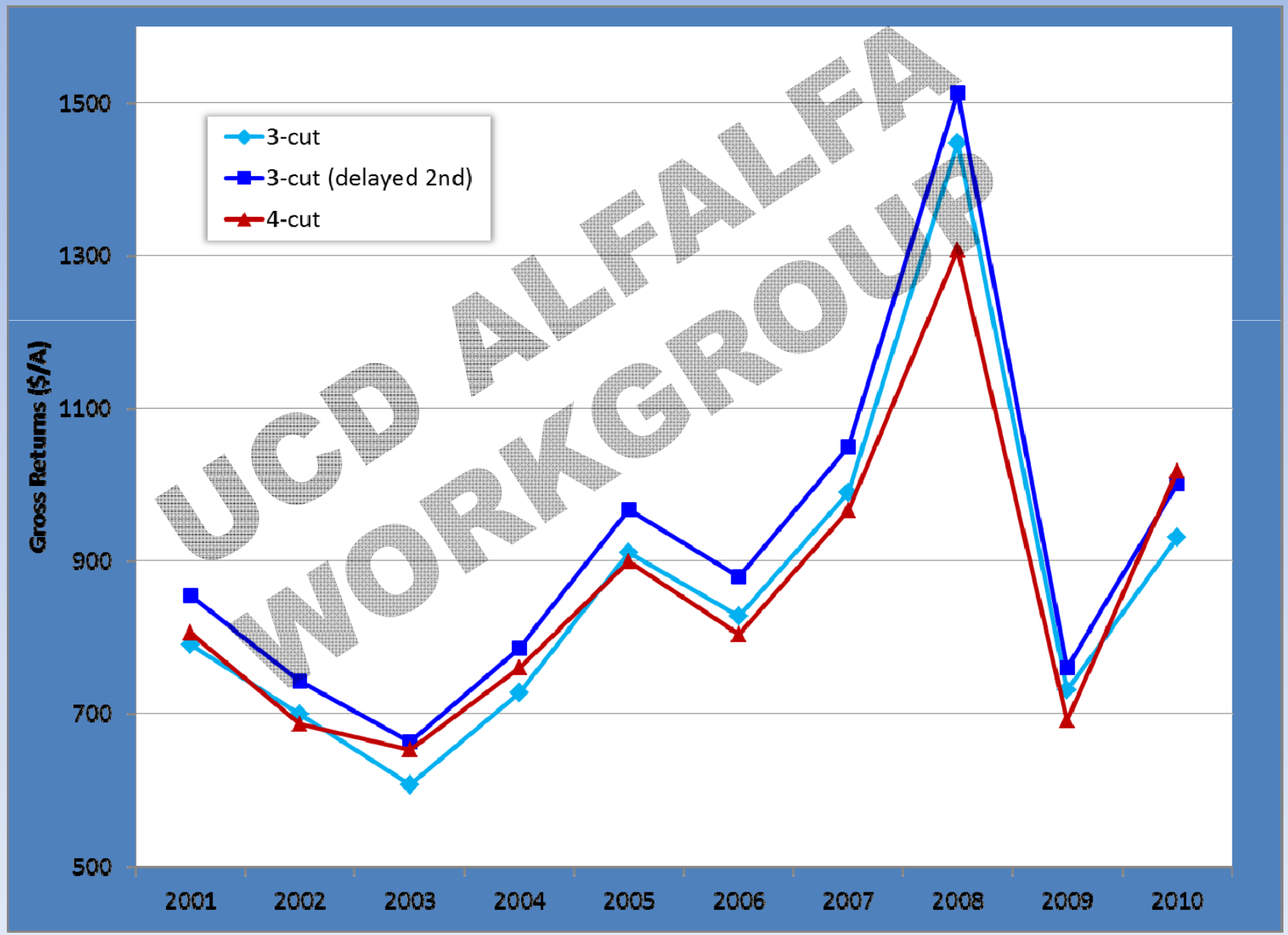
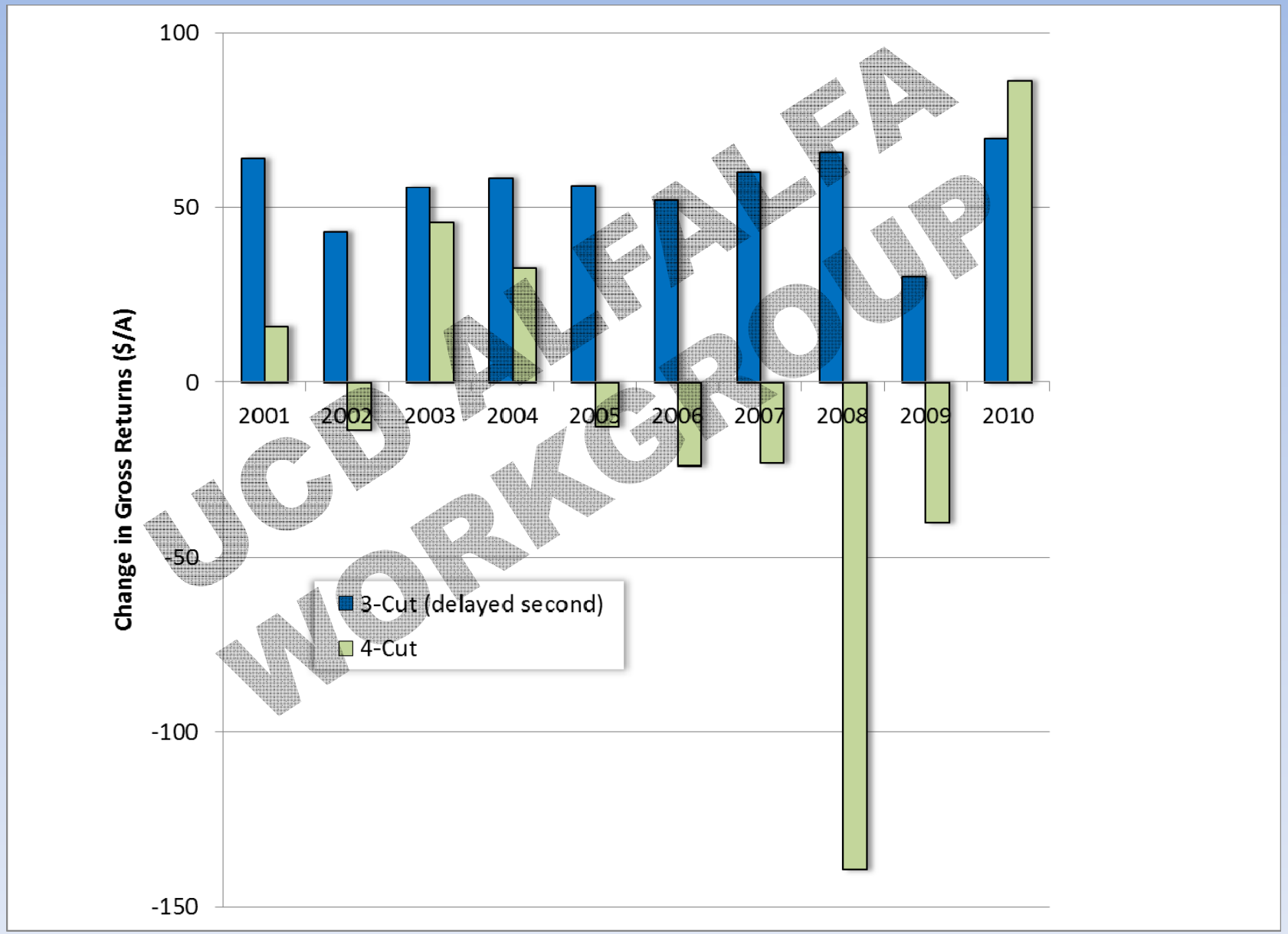
The Effect of Cutting Schedule on Gross Returns

Tulelake, CA

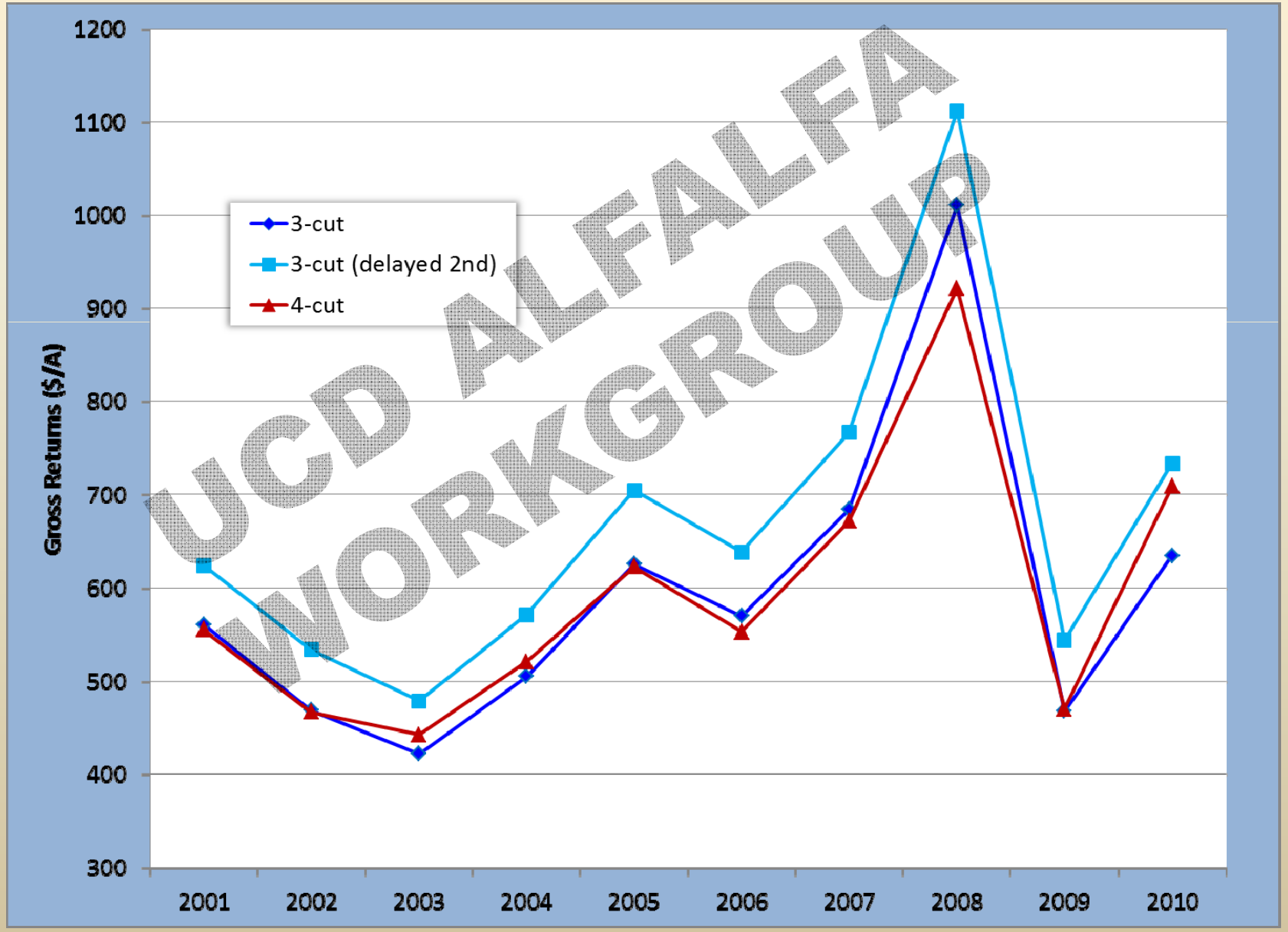


Difference in gross returns for a 3-cut schedule (delayed 2nd) and a 4-cut schedule compared with a standard 3-cut schedule. Tulelake, CA

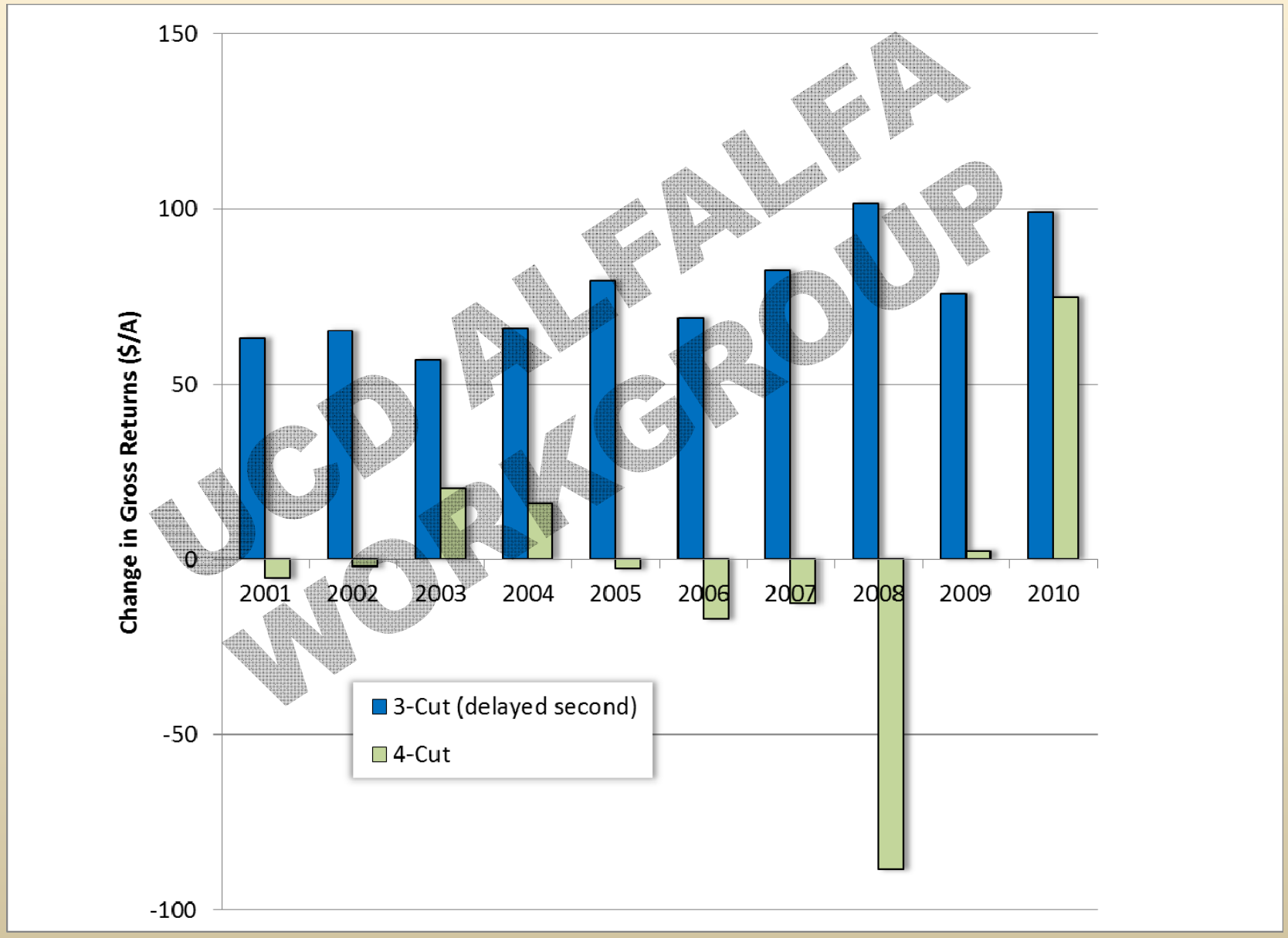


The Effect of Cutting Schedule on Gross Returns

Macdoel, CA



Difference in gross returns for a 3-cut schedule (delayed 2nd) and a 4-cut schedule compared with a standard 3-cut schedule. Macdoel, CA



Lessons to be Learned

- Determining the optimum cutting schedule is not a simple straightforward task
- Several factors must be kept in mind
- Key Factors:
  - Total seasonal yield, Forage quality, Alfalfa price (primarily the price spread between hay quality categories
- Other factors to consider:
  - Marketability of the hay
  - Effect of cutting schedule on stand persistence.

    Longer cutting schedules provide the alfalfa more time to replenish carbohydrate root reserves and improve overall stand vigor and persistence.

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Summary

- Data show importance of high yields for profitability.
- If a grower can develop a strong market for mature high-fiber hay then longer cutting schedules more profitable.
- However, for most growers, this type of alfalfa is difficult to market, particularly in low price years.
- Growers often forced to sacrifice profitability for high forage quality and use shorter cutting intervals, mainly to assure acceptance of their hay in the market.
- Among the more moderate cutting schedules (7 vs. 8 cuts in the Central Valley or a standard 3-cut schedule vs. a 4-cut schedule in the Intermountain area), the more profitable approach depends on market conditions.
  - In a high price year typically most profitable to go for yield
  - In a low price year go for quality. Ideally, the grower's cutting management schedule should be flexible enough to adjust to changing market conditions.
- Best overall approach likely a mixed strategy, not purely cutting for yield or solely cutting for quality.

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Happy Holidays!!!