ALFALFA NUTRIENT REQUIRMENTS, DEFICIENCY SYMPTOMS, AND FERTILIZER APPLICATION

UCD ALFALFA WORKGROUP

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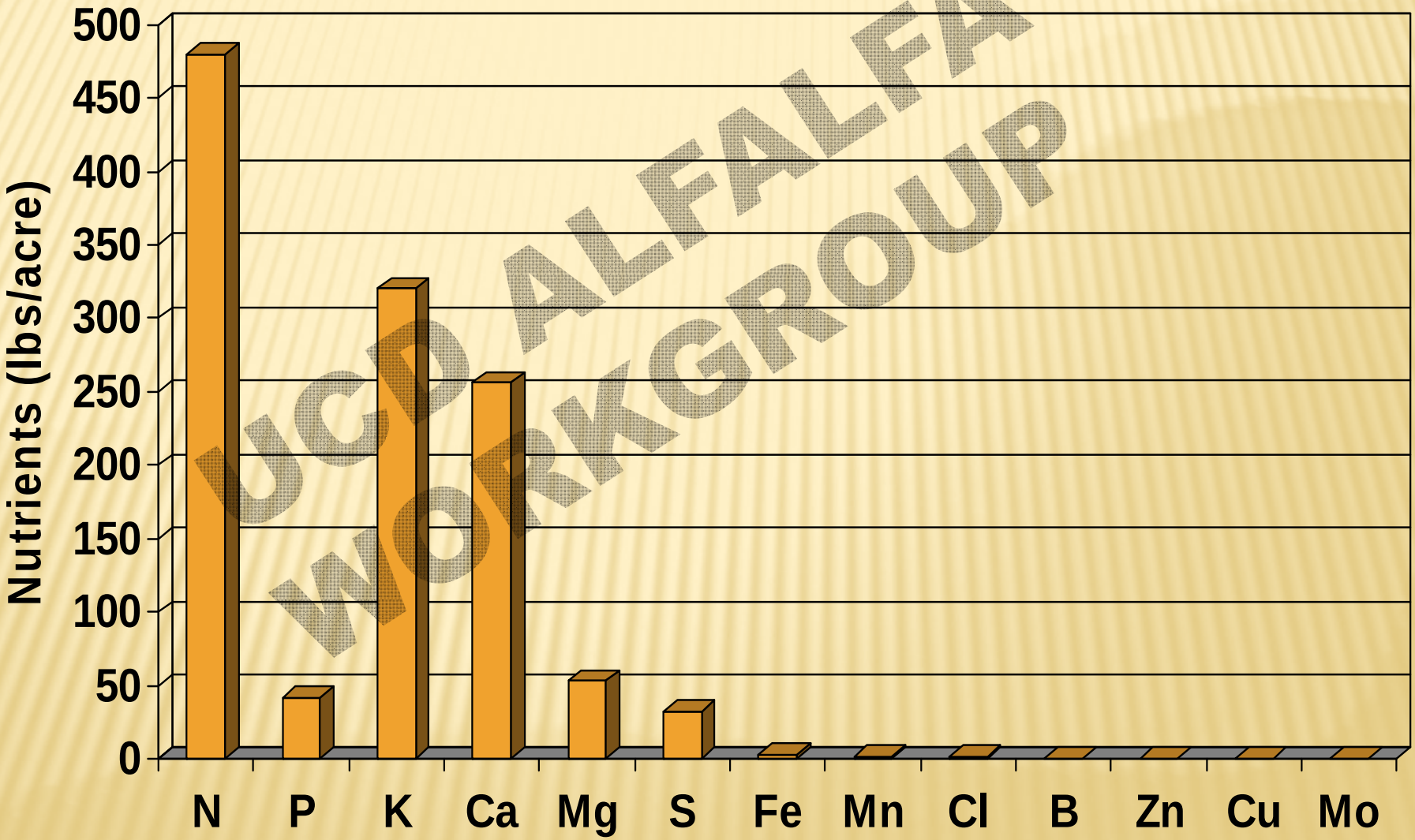
NUTRIENTS IN 8 T/A ALFALFA



NITROGEN DEFICIENCY

- Conditions
  - Poor nodulation
- Diagnosis
  - Few nodules on roots
  - Small yellow plants mixed with tall green plants
  - Tissue test (Mo or Co)
  - Symptoms similar to S or Mo def.
- Correction
  - Urea (46-0-0)
  - Max. = 50 lbs N/acre/cutting
  - pH > 6.3
  - Drill (3-5 lbs/a) 2-5x inoculated seed

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N-FIXING NODULE

CONDITIONS FAVORING N DEFICIENCY

- Seedling alfalfa
- Cold soils
- Hot soils
- Waterlogged soils
- Shallow soils
- Sandy soils
- Spring cuttings
- Intensive harvesting
- High yield levels
- Alfalfa-grass mixtures
- Mo or Co deficiency
- Low pH soils

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N STUDIES

Location	Yield increase	Comments
	(%)	
Imperial Valley	2.3	Winter 7% Summer 1%
Yuma Mesa	32	Nodulation? Irrigation
Tucson	4.5	No increase at 21 d cycle

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NITROGEN DEFICIENCY

PHOSPHORUS DEFICIENCY

- Conditions
  - Cold soils
- Diagnosis
  - Soil test
  - Tissue test
  - Symptoms similar to slight water stress
- Fertilizer
  - Mono-ammonium phosphate (11-52-0)
  - Max. = 100 lbs P_2O_5/acre/application

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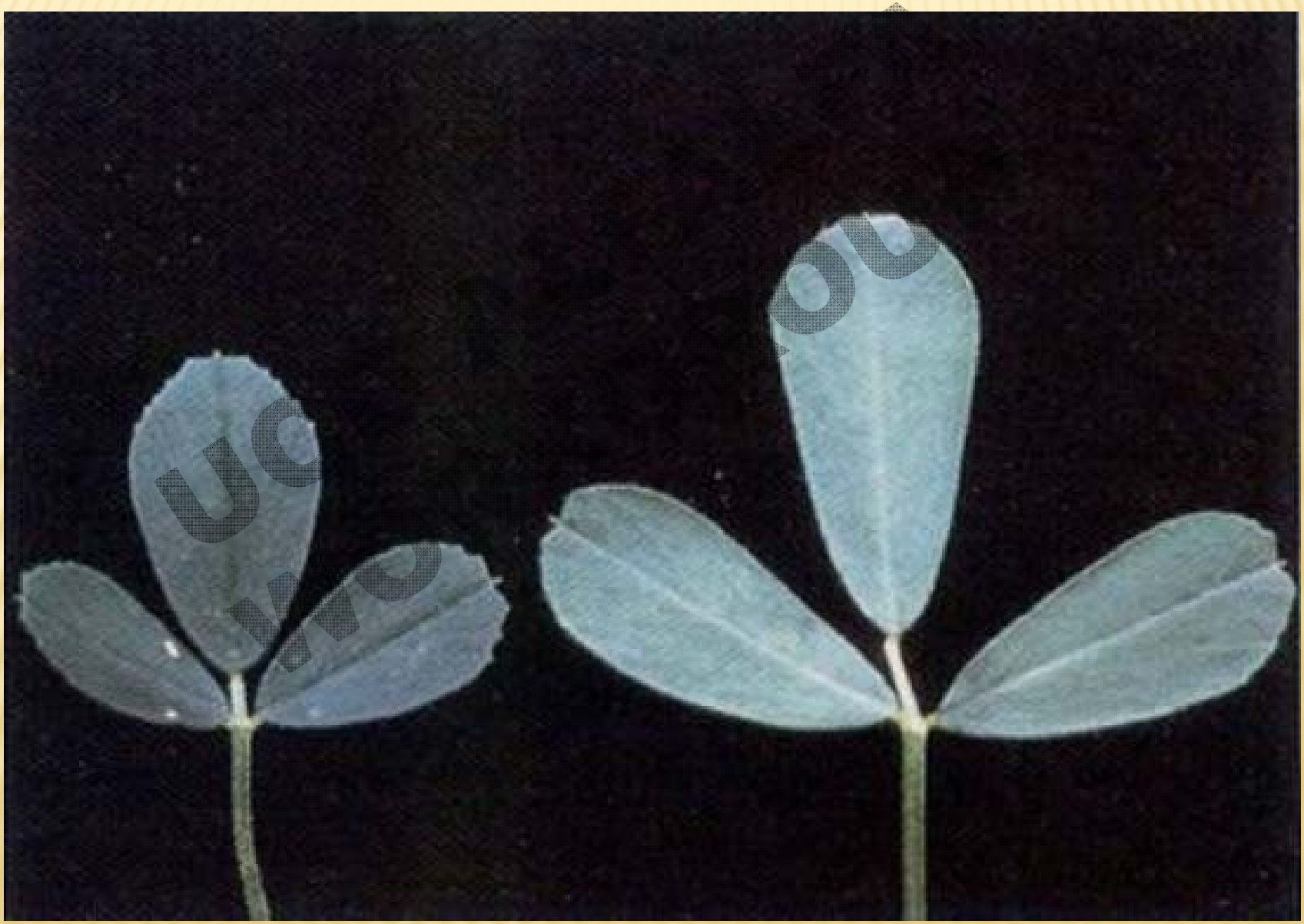
PHOSPHORUS DEFICIENCY



PHOSPHORUS DEFICIENCY

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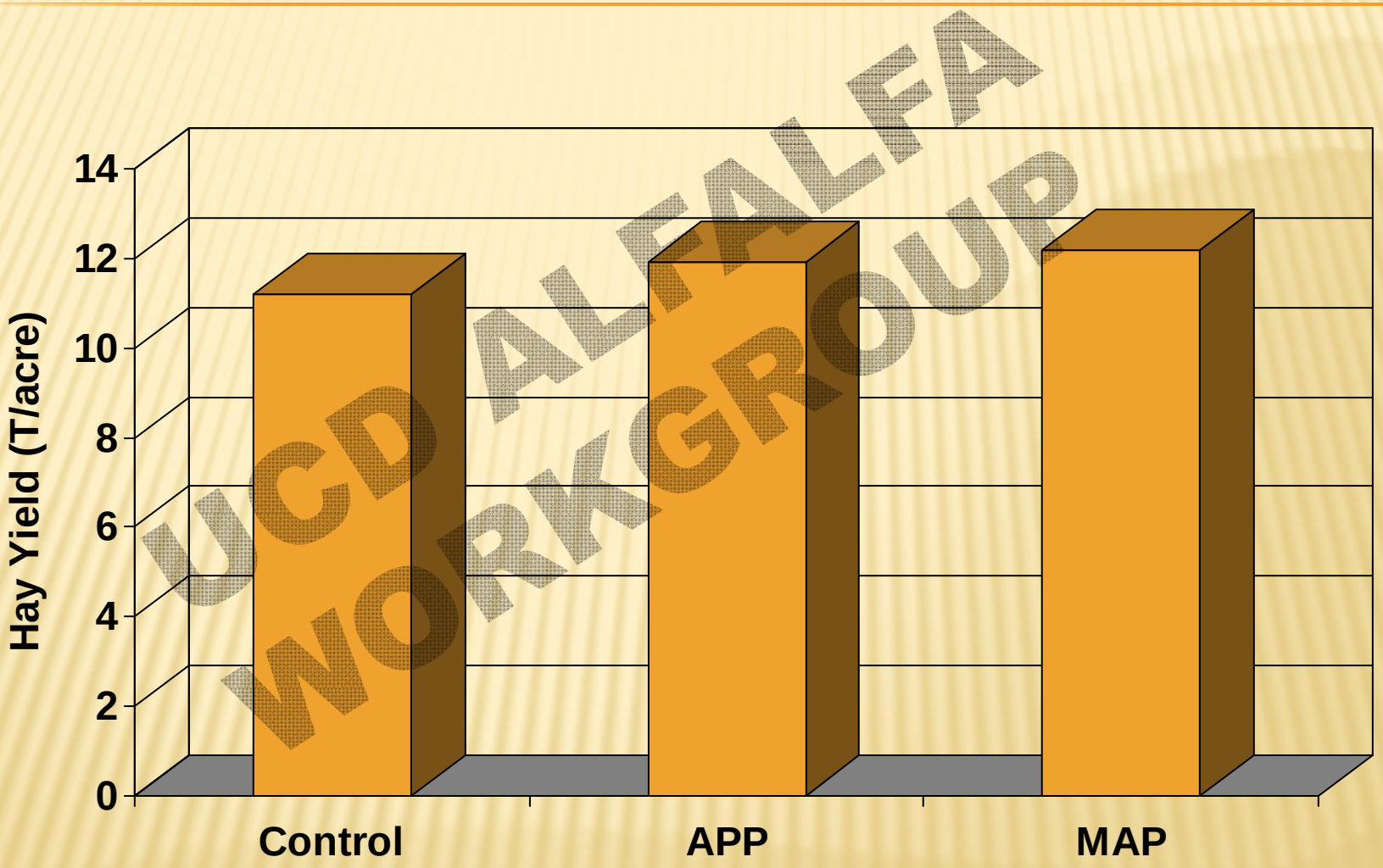
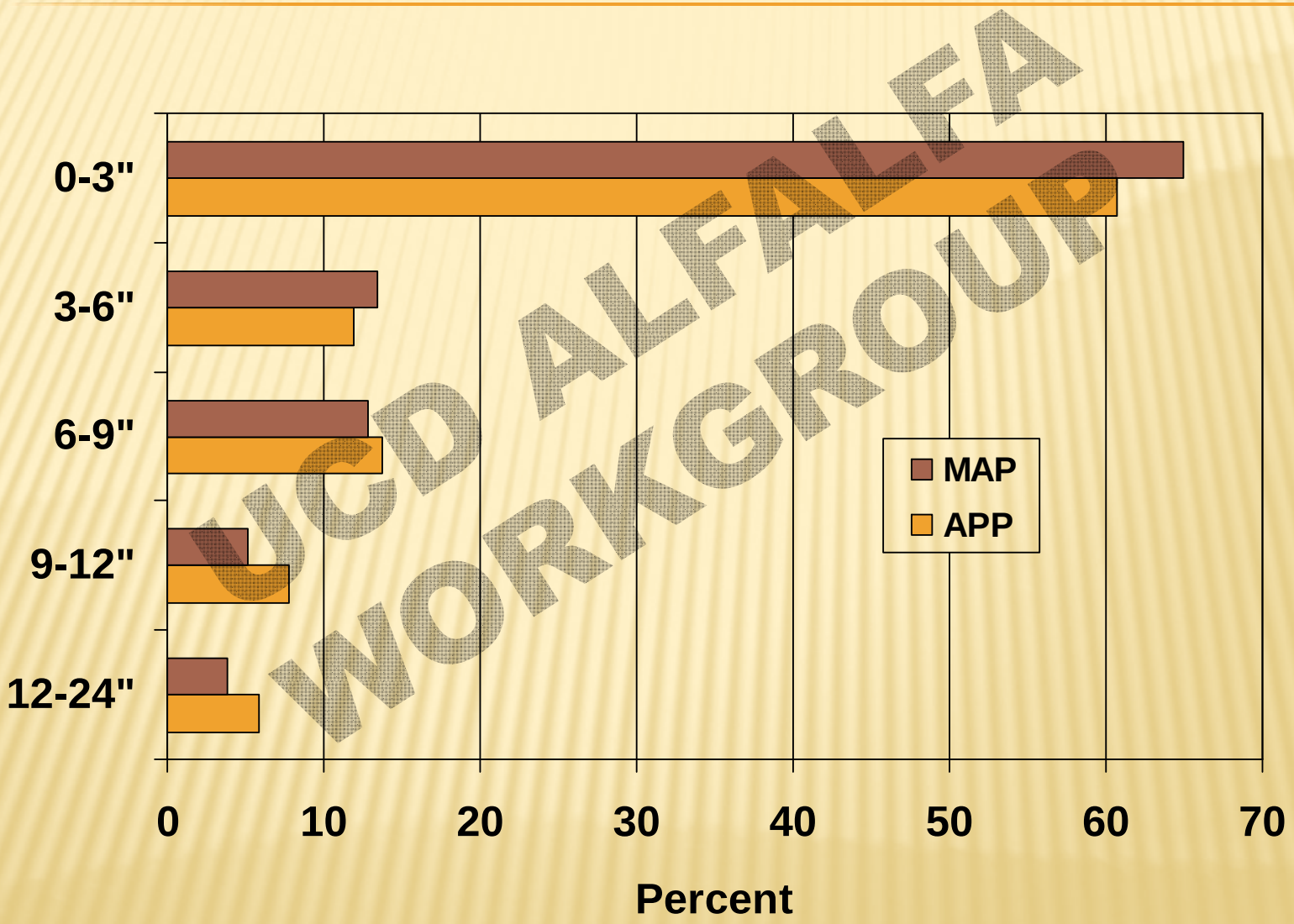
P STUDY - MARICOPA



P FERTILIZER MOVEMENT



POTASSIUM DEFICIENCY

- Conditions
  - Sandy soil
- Diagnosis
  - Soil test
  - Tissue test
  - Symptoms similar to blue alfalfa aphid
- Fertilizer
  - Muriate of potash (0-0-60)
  - Max. = 300 lbs K_20/acre/application

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POTASSIUM DEFICIENCY

SULFUR DEFICIENCY

- Conditions
  - Sandy, low OM soil
- Diagnosis
  - Tissue test
  - Symptoms similar to N or Mo def.
- Fertilizer
  - Gypsum (15-17% S)
  - Max. = 15 to 50 lbs S/acre/year

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SULFUR DEFICIENCY

BORON DEFICIENCY

- Conditions
  - Low OM soil
- Diagnosis
  - Tissue test
  - Symptoms similar to 3-corner leafhopper
- Fertilizer
  - Borax (11% B)
  - Max. = 1 to 3 lbs B/acre/life of stand

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BORON DEFICIENCY

MOLYBDENUM DEFICIENCY

- Conditions
  - Low pH soil
- Diagnosis
  - Tissue test
  - Symptoms N or S def.
- Fertilizer
  - Sodium molybdate (40% Mo)
  - Max. = 0.1 to 0.5 lbs Mo/acre/life of stand

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MOLYBDENUM DEFICIENCY

Wheat

Cucurbit

UC DAVIS
WORKSHOP

ALFALFA FERTILIZER FAQs

- Should I apply N fertilizer?
- Are liquid or granular P fertilizers better?
- Can P fertilizer be top-dressed?
- Do I have a micro-nutrient deficiency?
- Should I keep nutrients in balance?
- Do bio-enhanced fertilizers work?
- How about manure?

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