



ACTIVE RESTORATION OF DISTURBED MOJAVE DESERT

EXTREME MAKEOVER

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ACTIVE RESTORATION OF DISTURBED MOJAVE DESERT

**Succession
When
Decision Matrix
Case Studies - Projects**

Succession

Secondary Succession on Disturbed Sites at Yucca Mountain, Nevada

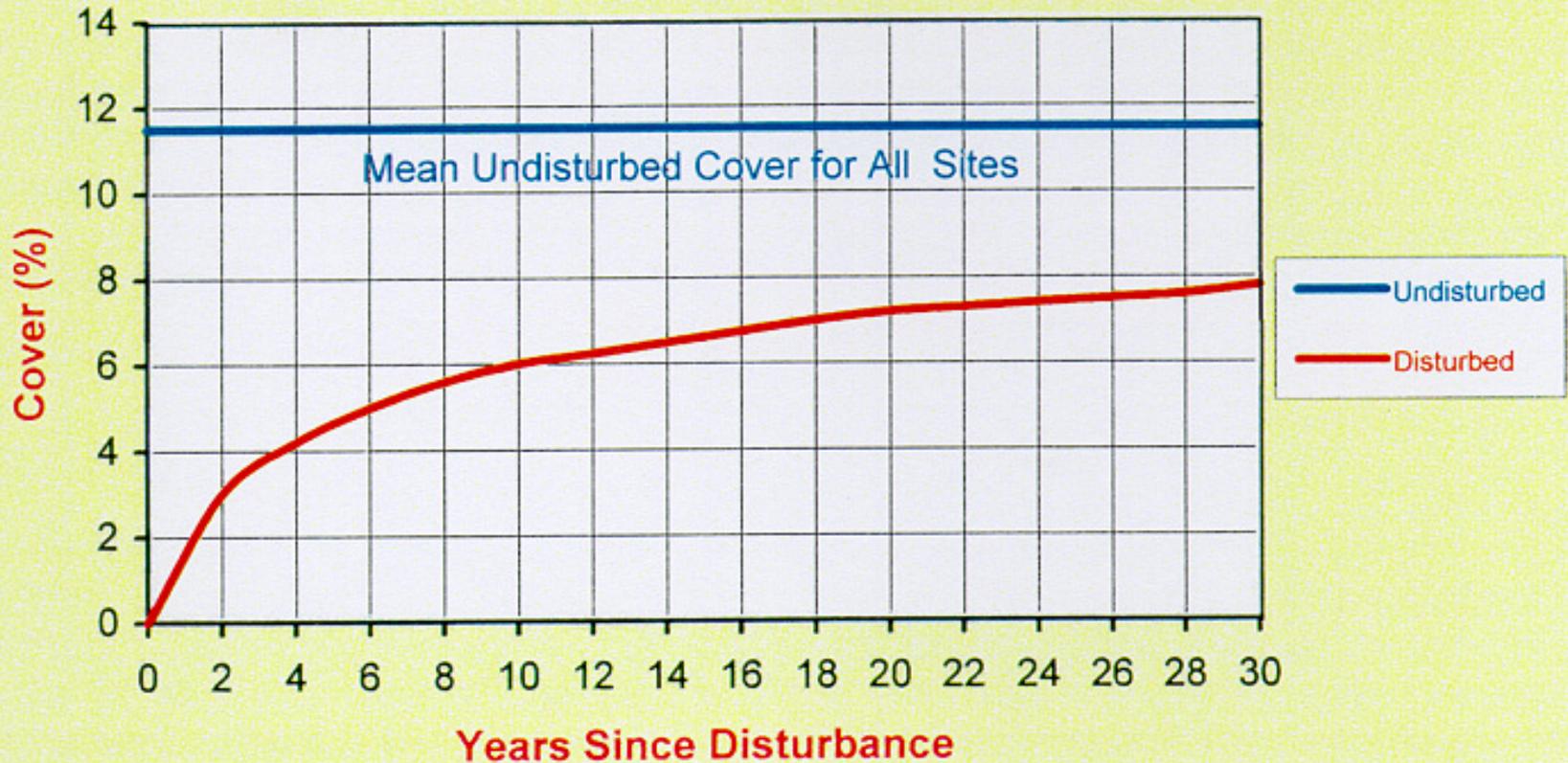
Angerer et al. 1994

- 1) 236 sites
- 2) 7-13 years since disturbance
(1978-1984)
- 3) Total cover, Cover by species
- 4) Species diversity
- 5) Factors that influenced succession
rate

Succession

Results

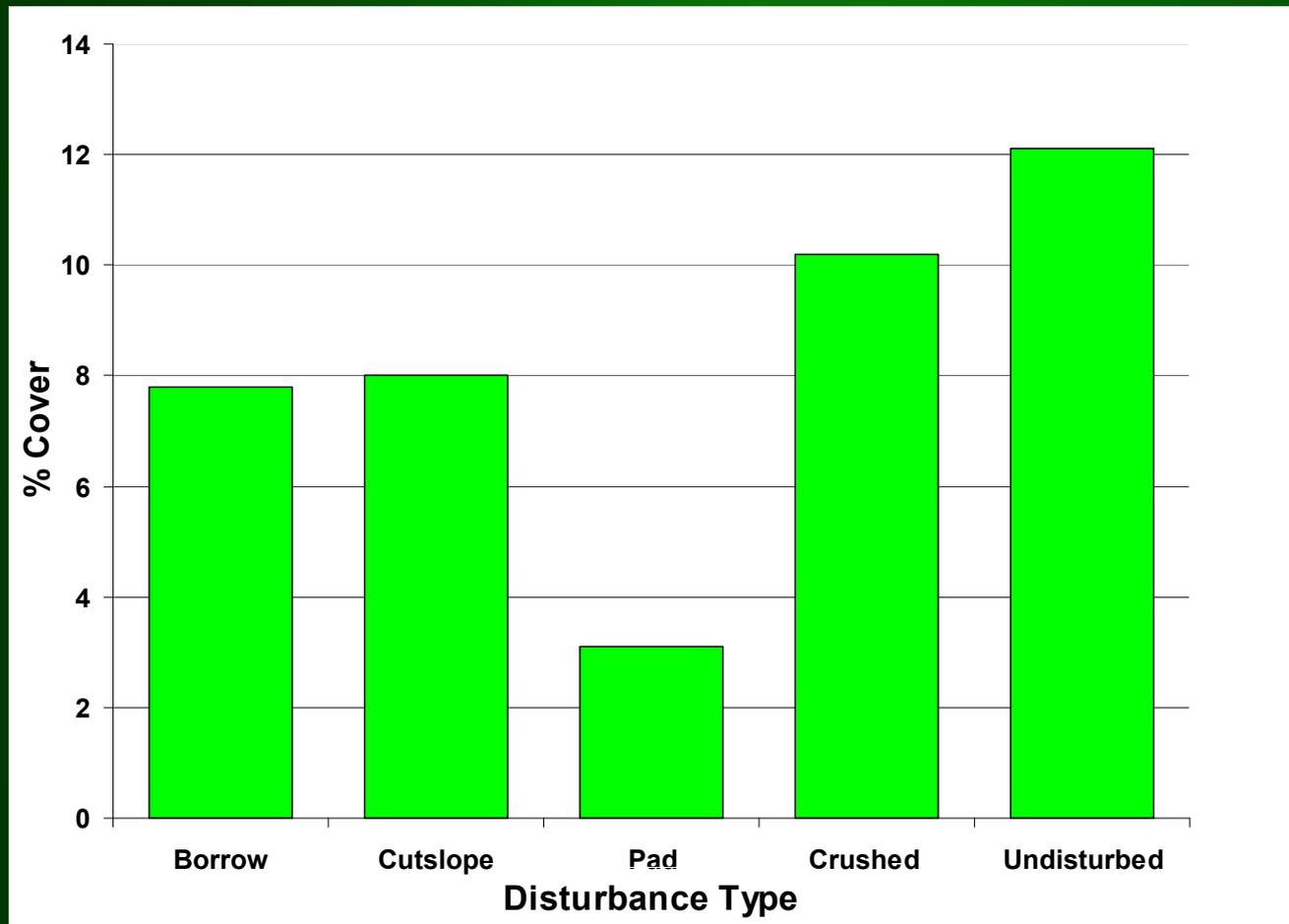
Projected Recovery Rate for Mojave Desert Disturbed Sites



Succession

Results

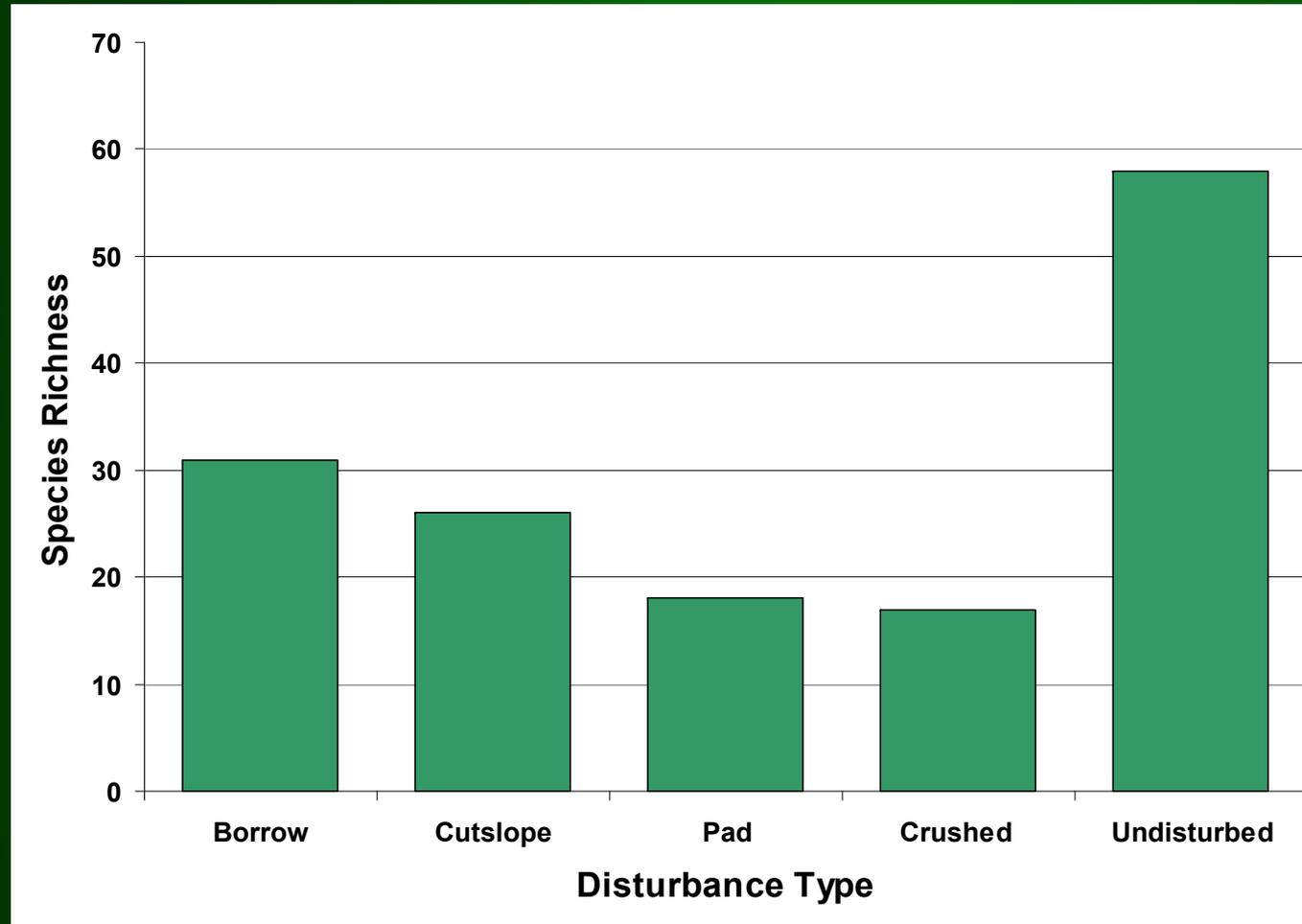
Type of disturbance influenced cover, species composition, diversity and dominance, and succession rates



Succession

Results

Type of disturbance influenced cover, species composition, diversity, and dominance, and succession rates



Succession

Conclusions

- 1) Time required for cover 20-845 years
- 2) Time required for species composition even longer
- 3) After 10 years - reclamation goal of cover, form, productivity not met
- 4) Species dominate in disturbed sites were minor components of undisturbed sites
- 5) Elevation, soil compaction, soil potassium, % sand and gravel were key factors that influenced succession rate

When do you actively restore a disturbance?

1) Active erosion - Water



When do you actively restore a disturbance?

2) Active erosion - Wind



When do you actively restore a disturbance?

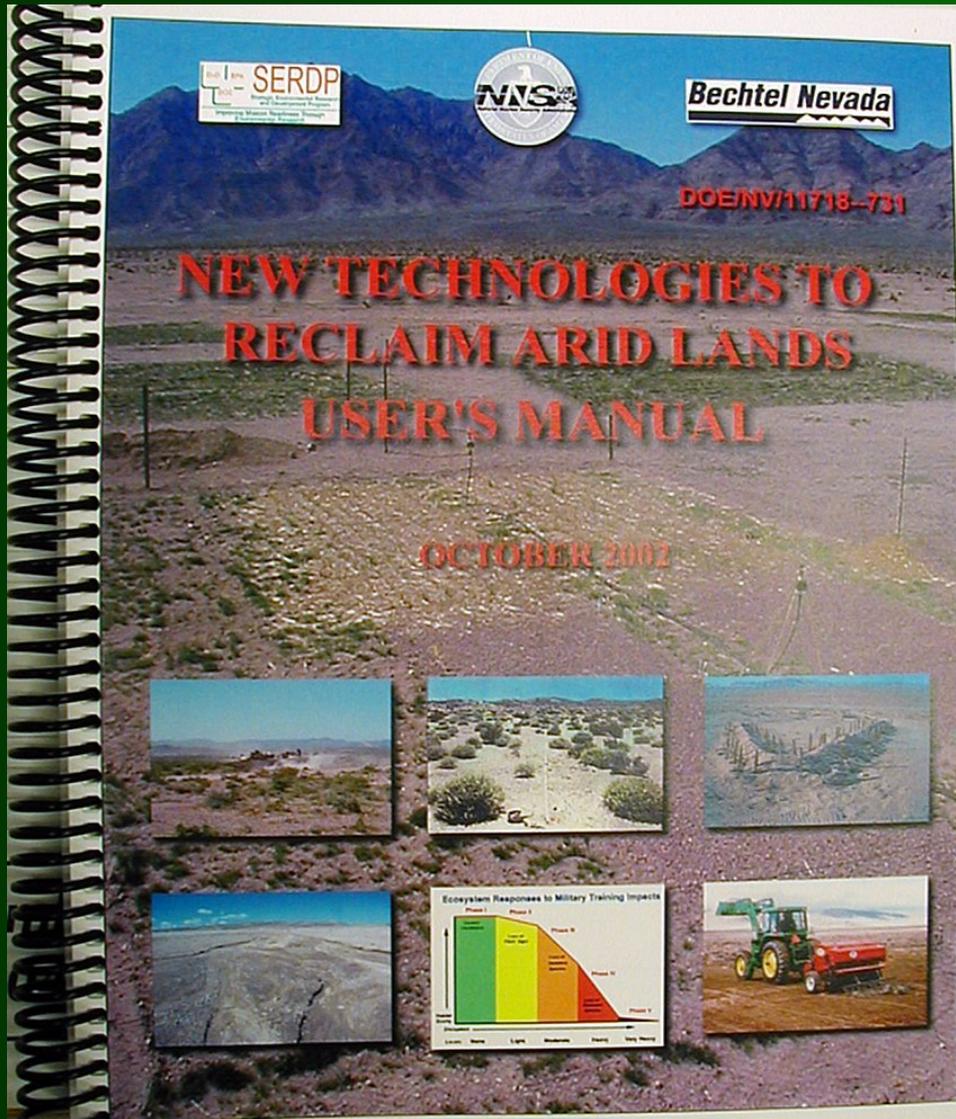
3) Large disturbances/lack of seed sources



When do you actively restore a disturbance?

- 4) Poor soils – low nutrients, no fines, low organic matter, lack soil microbes
- 5) Soil compaction
- 6) Visual/Aesthetics needs
- 7) Weed Problems

When do you actively restore a disturbance?



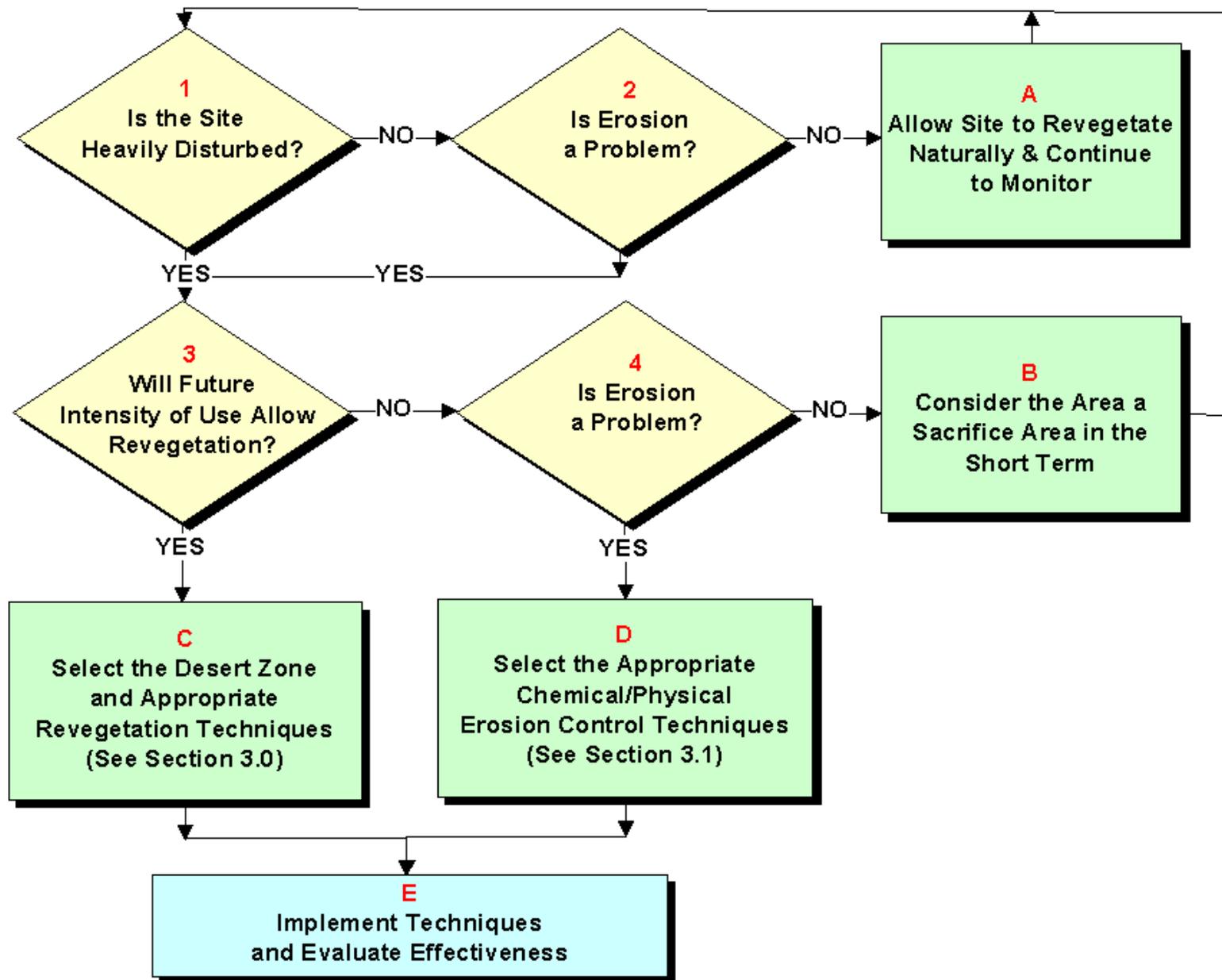
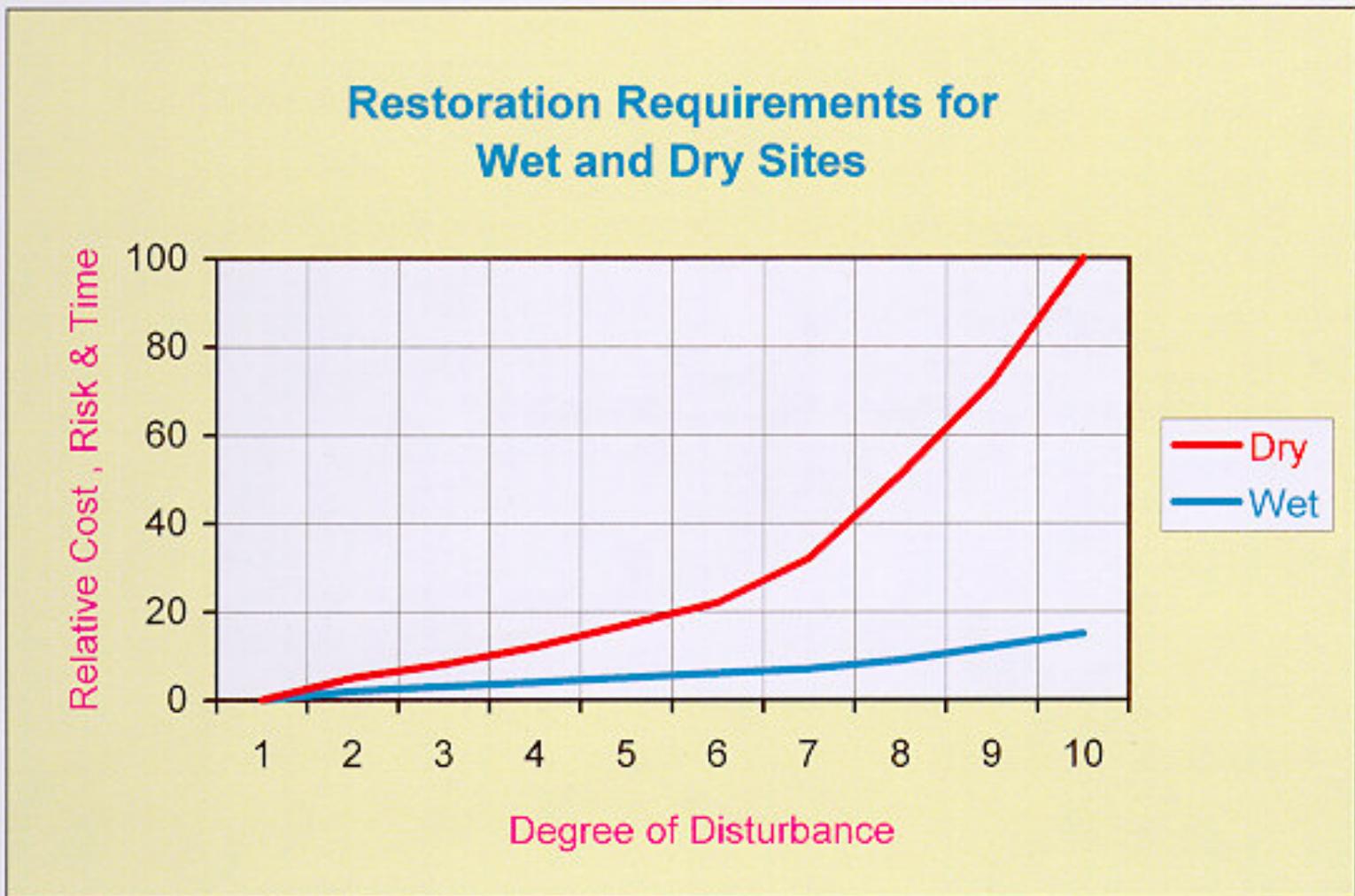


Figure 6-1. Flow diagram of decision making for erosion control and revegetation techniques.

CAN WE RESTORE DISTURBED MOJAVE DESERT ?



CONCEPTUAL MODEL



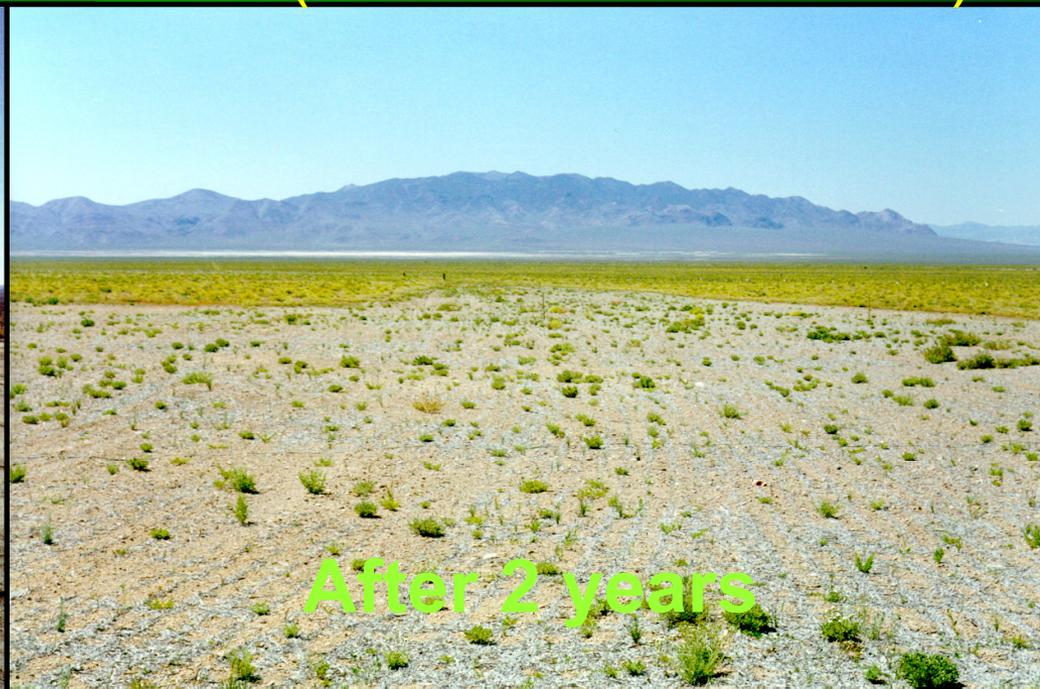
- Planning
- Timing
- Techniques
- Materials
- Irrigation
- \$\$ Money \$\$

Clients - Examples

Taken from D.C. Anderson and W. K. Ostler, 2002 Revegetation of Degraded Lands at Department of Energy and Department of Defense Installations: Strategies and Successes. Arid Land Research and Management Vol.16:197-212.

Double Tracks

- Removed top 2-6 inches of topsoil
- Seeded with 15 species native to area in 1996
- Irrigated 4.4 inches first spring
- Density 1997 = 0.81 plants/ft²
- Density 1998 = 0.64 plants/ft² (Undisturbed = 0.21)



YMP Demonstration

Seeded 1992

33 different treatments -

Water conservation, seeding techniques, soil amendments

Winkel et al. 1999



No Makeover



Examples

YMP JF-3

Seeded fall 1992

Mulch and gel treatments

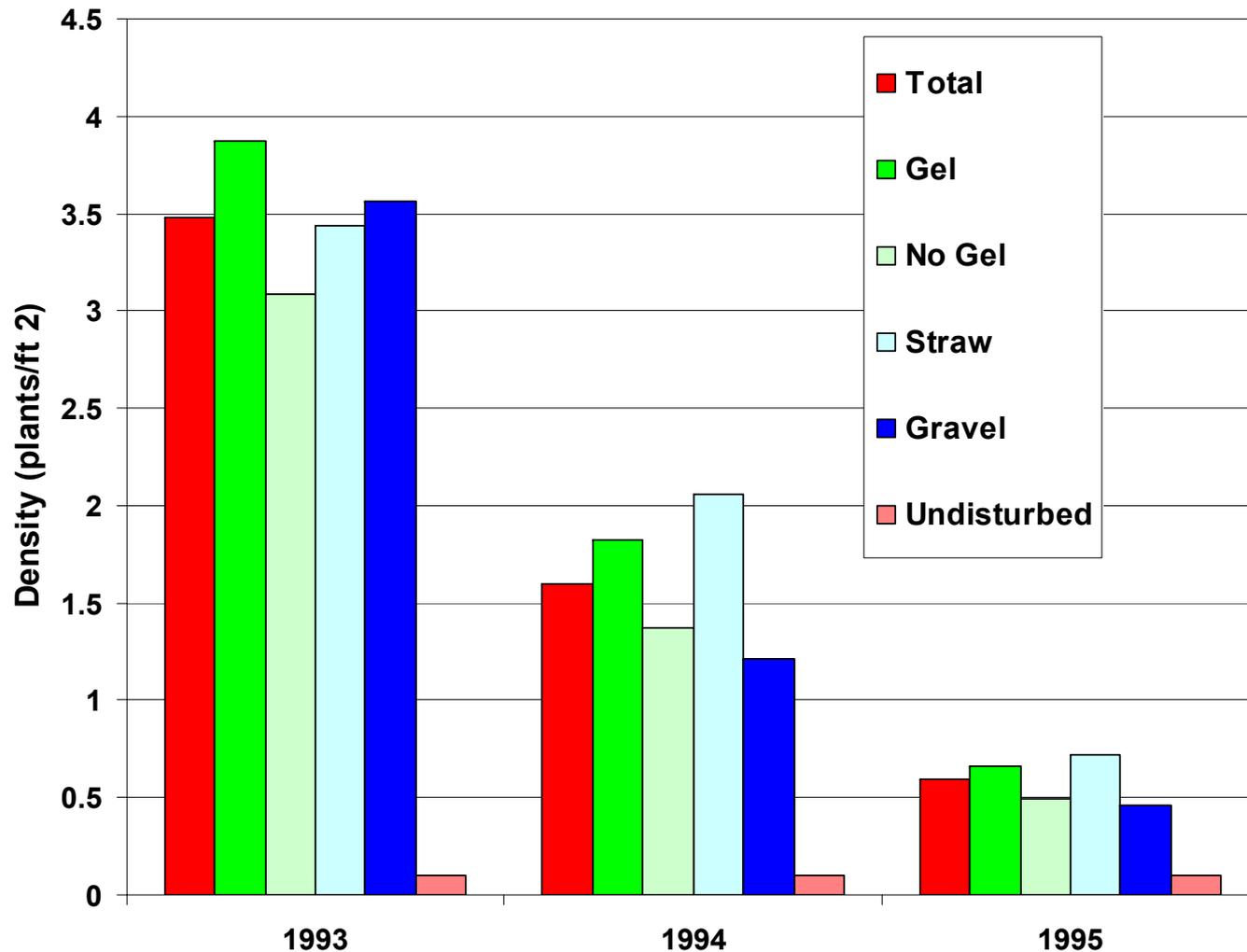
Winkel et al. 1999



Examples

YMP JF-3

1995 Cover = 8.3-10.6%
Undisturbed Cover = 8-16%



Examples

YMP JF-3

1999



Examples

YMP JF-3

January 2002



Examples - NTS

Uaxbl cover cap

- Subsoil cap - sterile
- Seeded with 12 species native to area in 2000
- Irrigated 4.9 inches first spring
- 2001 Density 5.2 plants/ft²



Examples - NTS

Frenchman Flats

- UCLA plots – Dr. Van Romney
- Transplants with 5 species native to area - 1981
- Irrigated by hand as needed first year



Examples

Fort Irwin

Drinkwater

Seeded, mulched, irrigated

May 2000 density = 6.4 plants/m²



December 1999



March 2002

Examples

Fort Irwin

Langford

Seeded, mulched, irrigated

May 2000 density = 0.37 plants/m²



May 2001

Examples

Fort Irwin

2001 test plots

Treated seed, mulches, seeding dates
irrigated



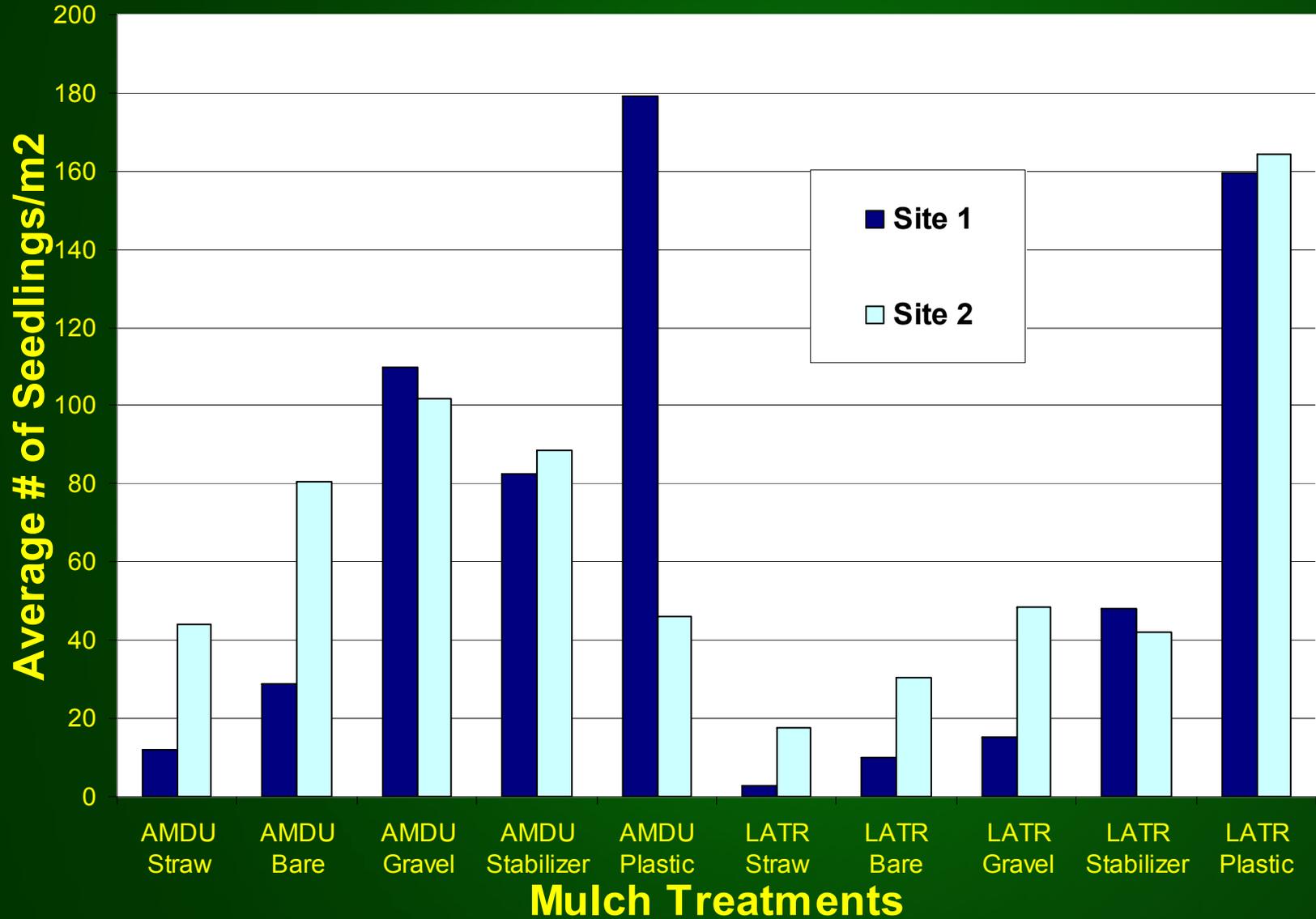
April 2001



July 2001

Examples Fort Irwin

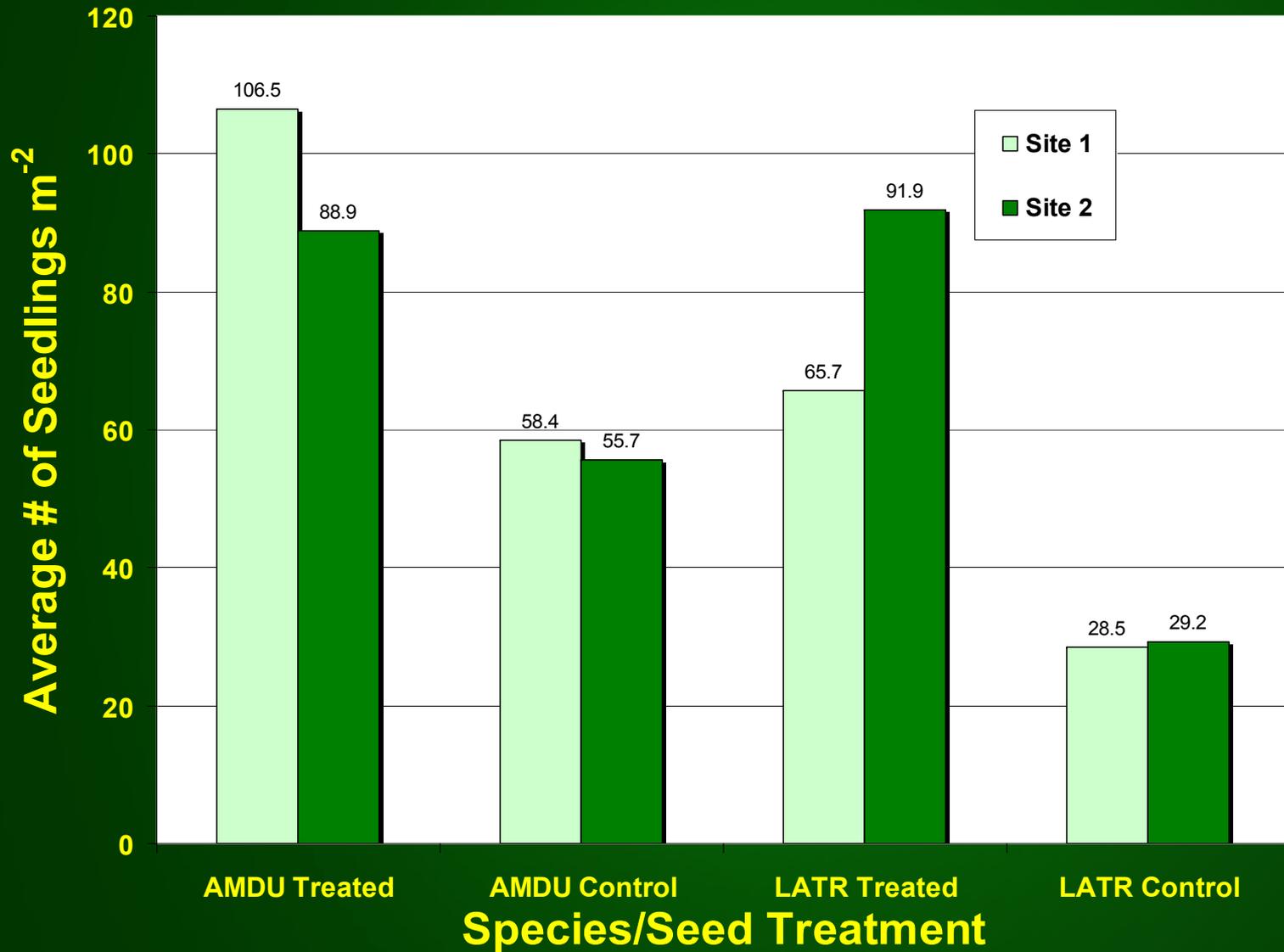
2001 test plots



Examples

Fort Irwin

2001 test plots

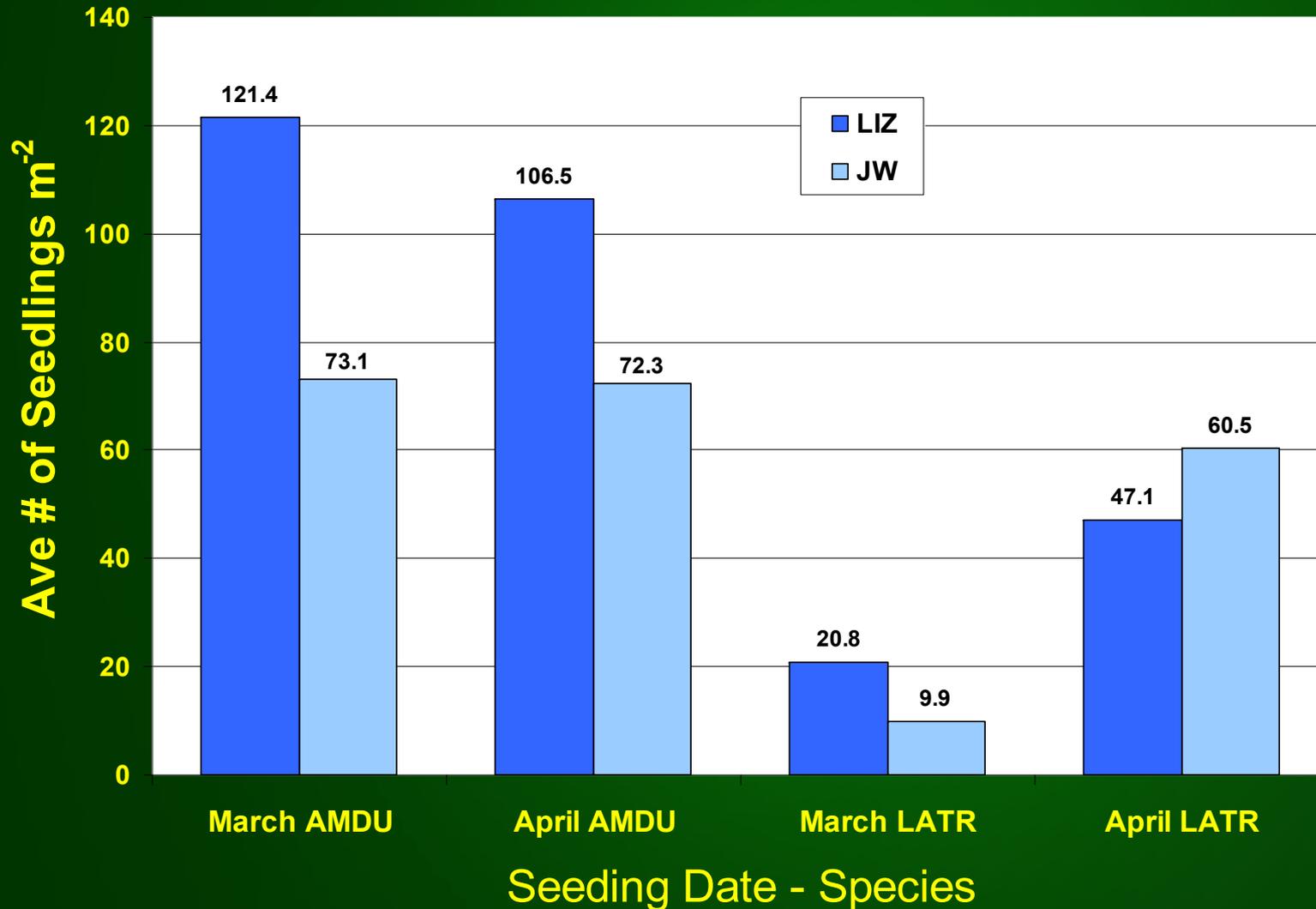


Examples

Fort Irwin

2001 test plots

Temperature Impacts on Germination

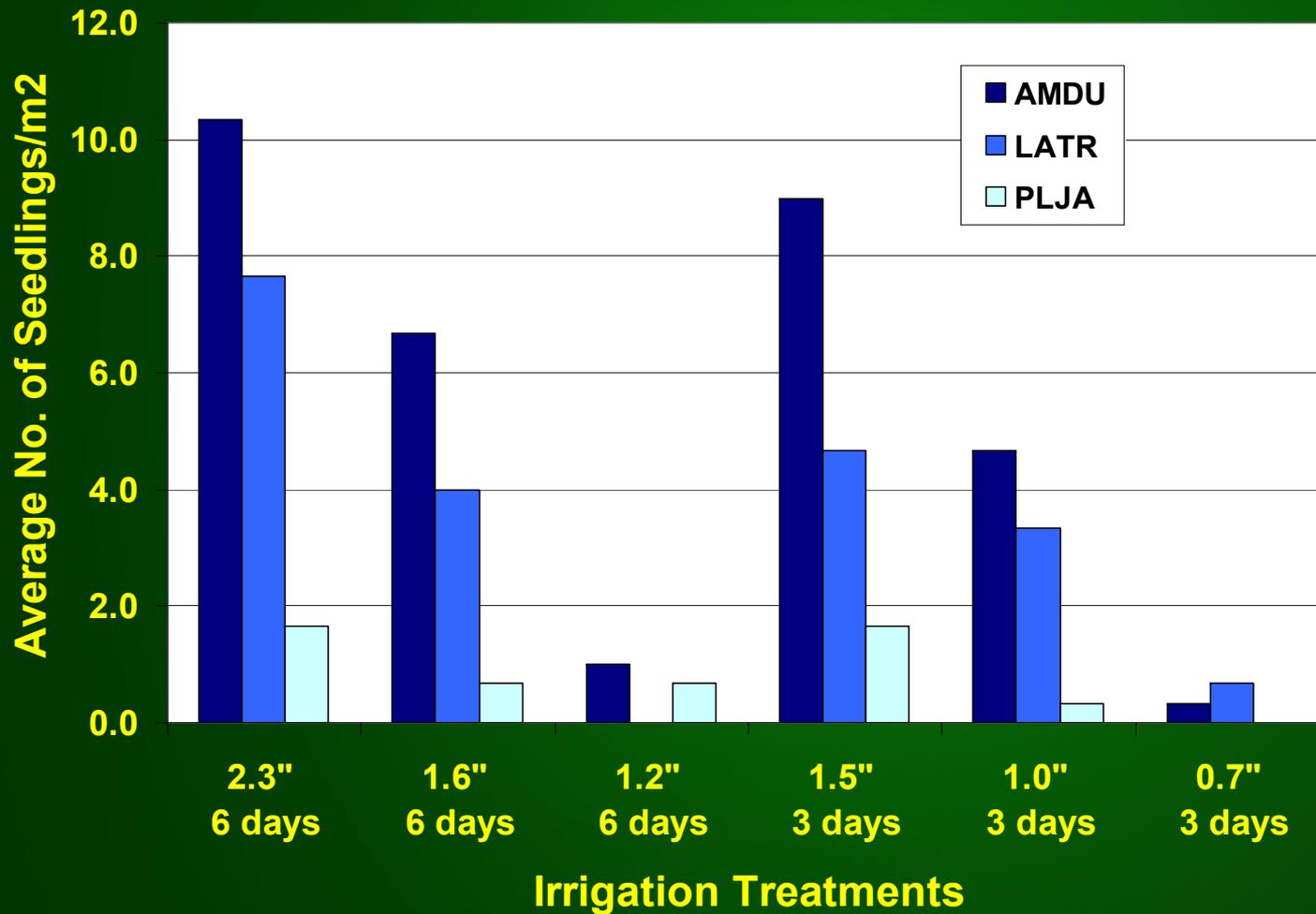


Examples

Fort Irwin

2001 September test plots

Germination

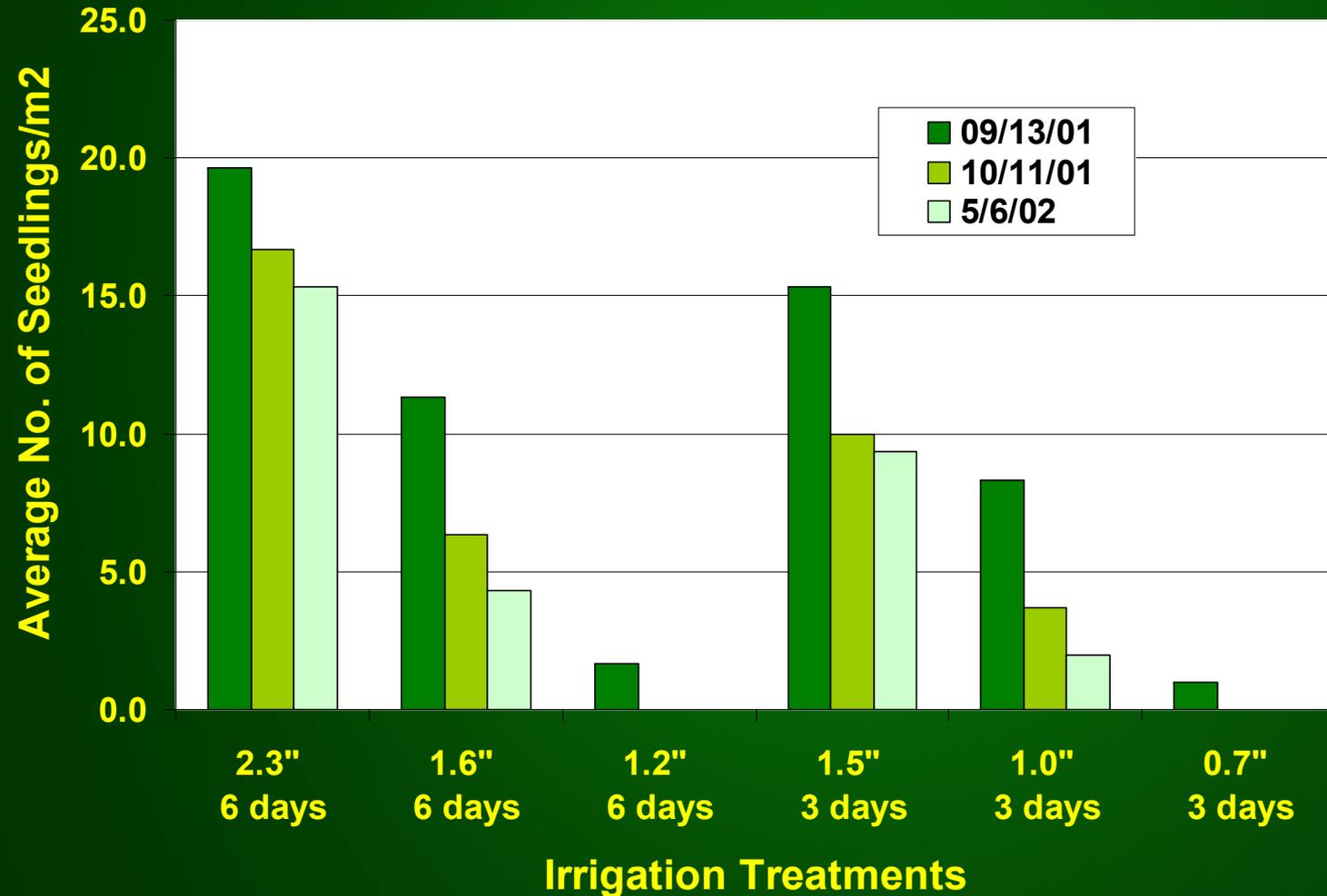


Examples

Fort Irwin

2001 September test plots

Seedling Survival



Extreme Makeover - Fort Irwin

2002 Ammo Supply Road



One Ugly Site

Extreme Makeover Fort Irwin

Dermal abrasion/Skin peel



Extreme Makeover Fort Irwin

Applications of Botanicals



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Application of masks



Extreme Makeover Fort Irwin

Moisturizer application



Extreme Makeover Fort Irwin

Time Treatment



November 2002

Extreme Makeover Fort Irwin

Time Treatment



November 2004

Extreme Makeover Fort Irwin

March 2002



Extreme Makeover Fort Irwin

November 2004



Extreme Makeover Fort Irwin



March 2002



November 2004

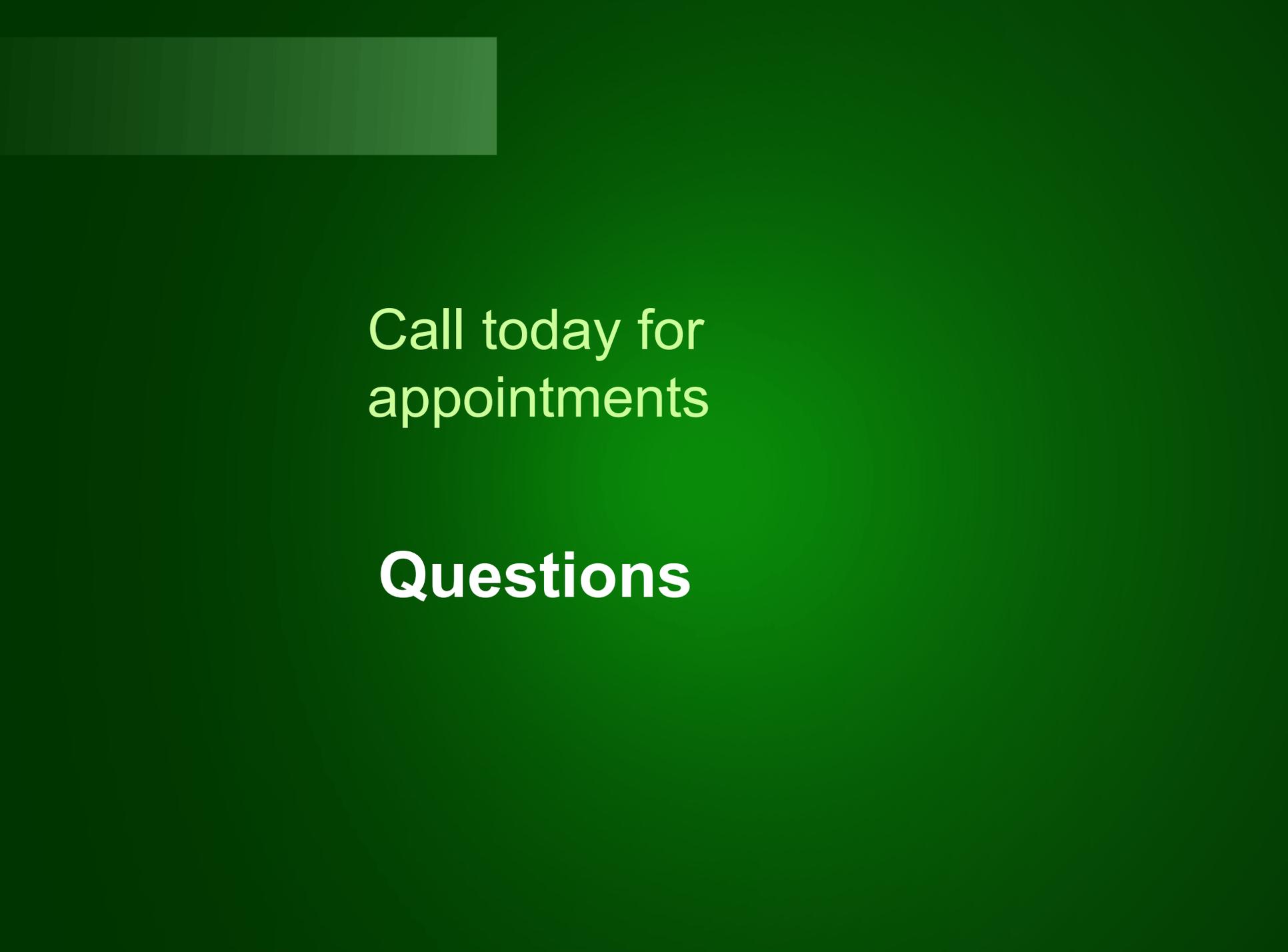
Extreme Makeover Fort Irwin



October 2002



November 2004



Call today for
appointments

Questions