A Gum-Boot Guide to Irrigation Scheduling

Presented by:

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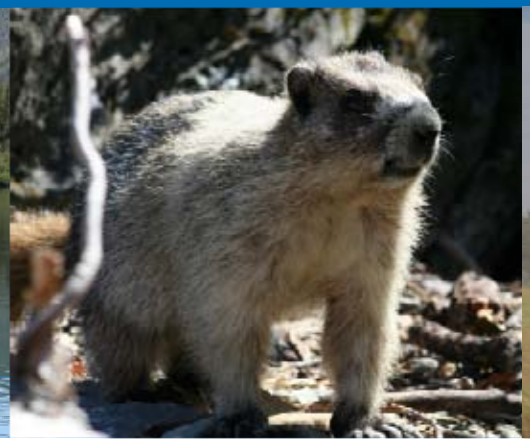
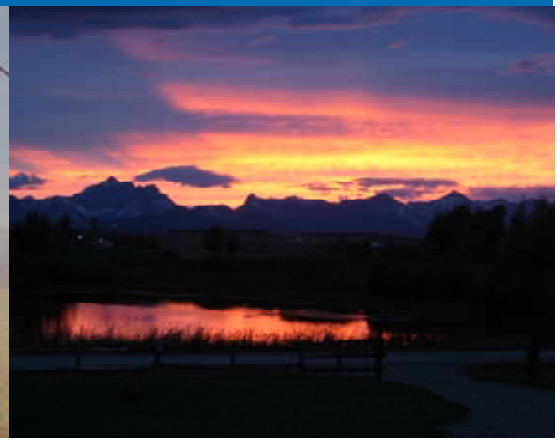
Overview

1. Why you should Schedule Irrigations.
2. Back to the Basics.
3. A Simple Plan that Works.
4. 7 Ugly Truths about Irrigation Farming
   (Things you Would Rather Not Talk About)



1. Why Schedule Irrigations:

- Lack of Irrigation Scheduling is the weakest link in our irrigation production system.
- Most farmers “get by” without a agronomy based scheduling method (CSM or WIGATI)
- Most farmers are NOT getting top yields.
- A 5 to 10% increase in yield from improved irrigation management is common.

Why Should You do this?

- Usually there is little increase in variable costs from improved irrigation management.
- Plan more, put out fires less.
- Work around disease & insect management.
- Perhaps you can even plan a vacation!
- Apply enough water WHEN the crop needs it.
- You should do this to make more profit.

It doesn’t have to be complicated.

- Irrigation Scheduling is like financial budgeting; an inexact science at the best… but you can still benefit from the process.
- You can do a half-baked job and still be better off than if you just guess.
- If you mess up; every week is a fresh start!
- In the process you will be out in the field learning other things about your crop.

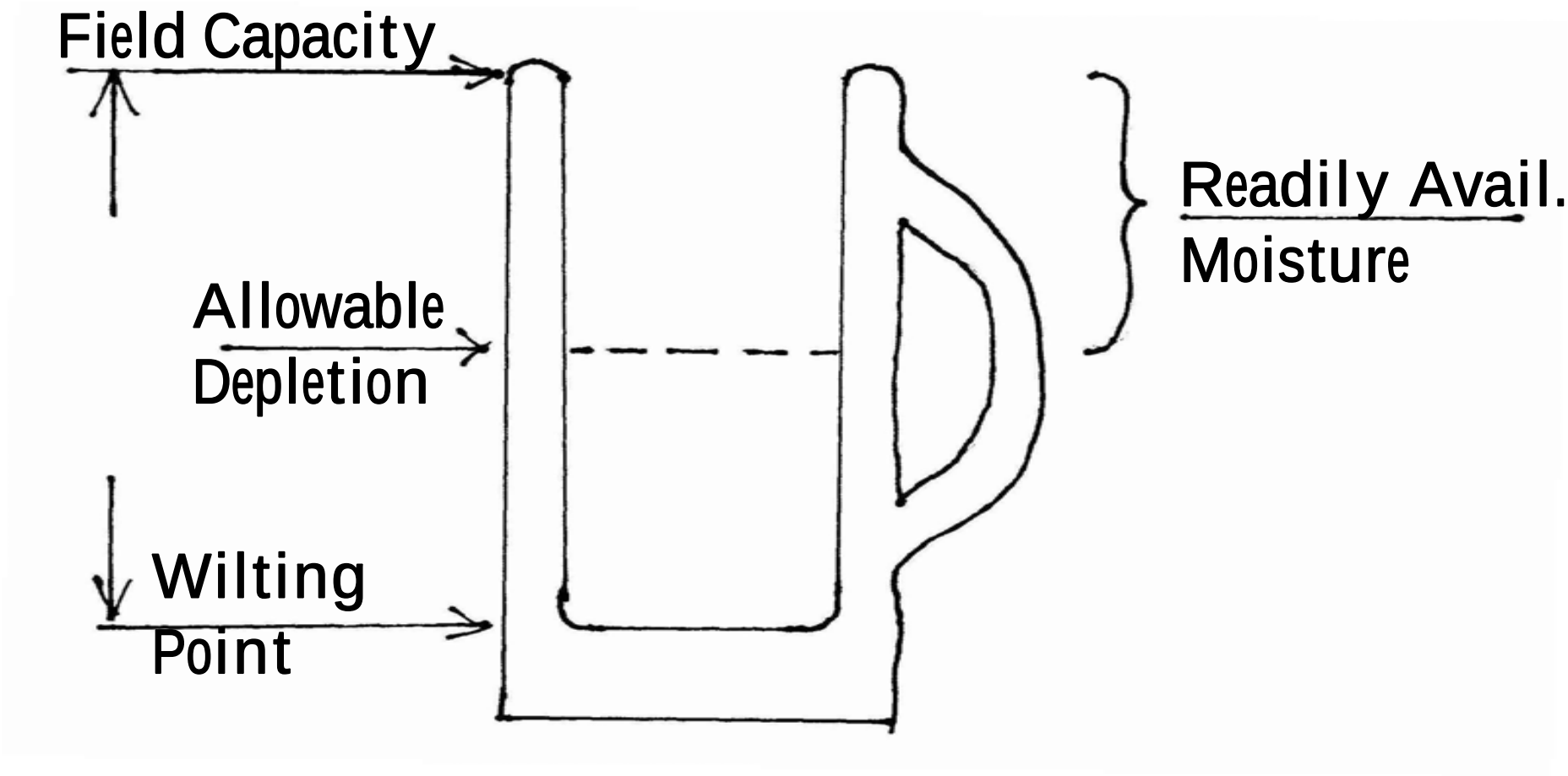
2. Back to Basics: Soil & Water Stuff

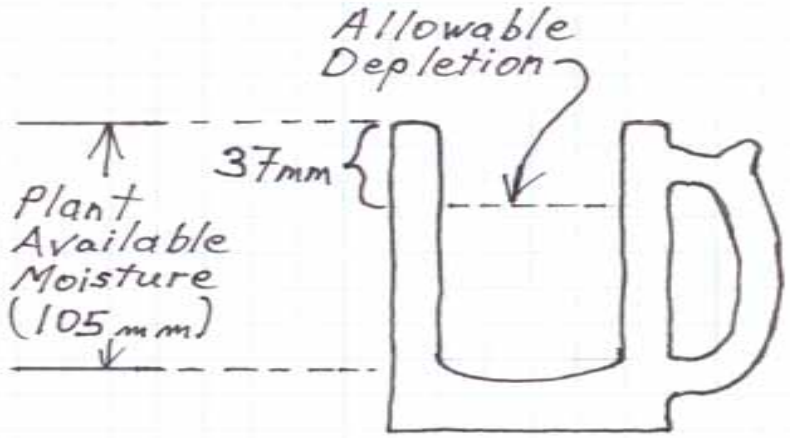
- Before you fill ANY container; You need to know how much it will hold.
- Consider the root zone as a container;
  one which you fill, and the crop empties.
- a.k.a. “reservoir capacity” or “bucket size”
- There may be different bucket sizes in a field
- Do you know your “bucket size?”

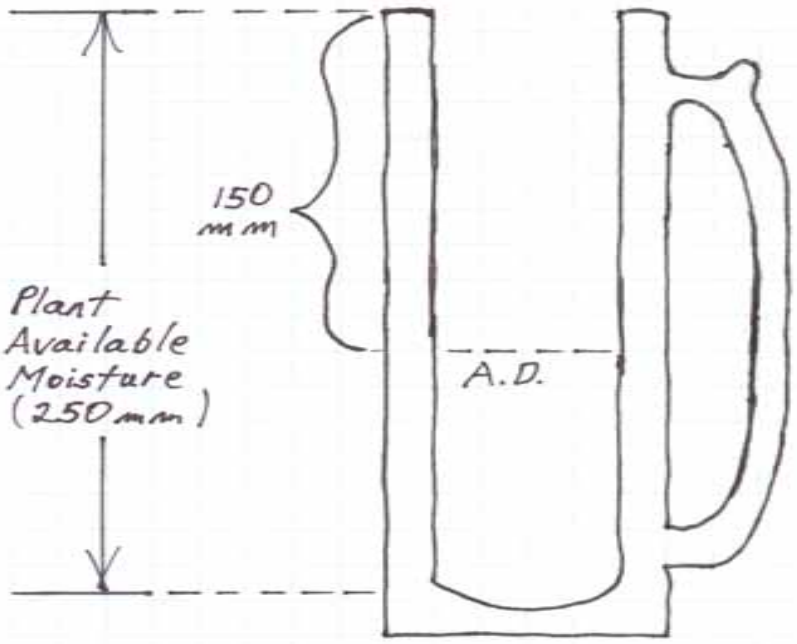
“Bucket Size” depends upon:

- Soil Texture (NOT uniform with depth)
- Crop rooting depth.
- How dry you can allow the reservoir to get before the crop suffers (Allowable Depletion)
- Reminder: The Bucket Size (and how you have to mange) changes year to year as you rotate crops.

Bucket Size for College Students







Neil's Mug

Jake's Mug

Which of these would you rather manage?

3. A Simple Plan that Works

- This is only one of many ways to Schedule Irrigations.
- This is a very simple plan, with the idea that if it remains simple, you are likely to actually use it.
- Gum Boots are easier to understand (and more reliable) than micro chips.

High Tech Tools you need to Schedule Irrigations:

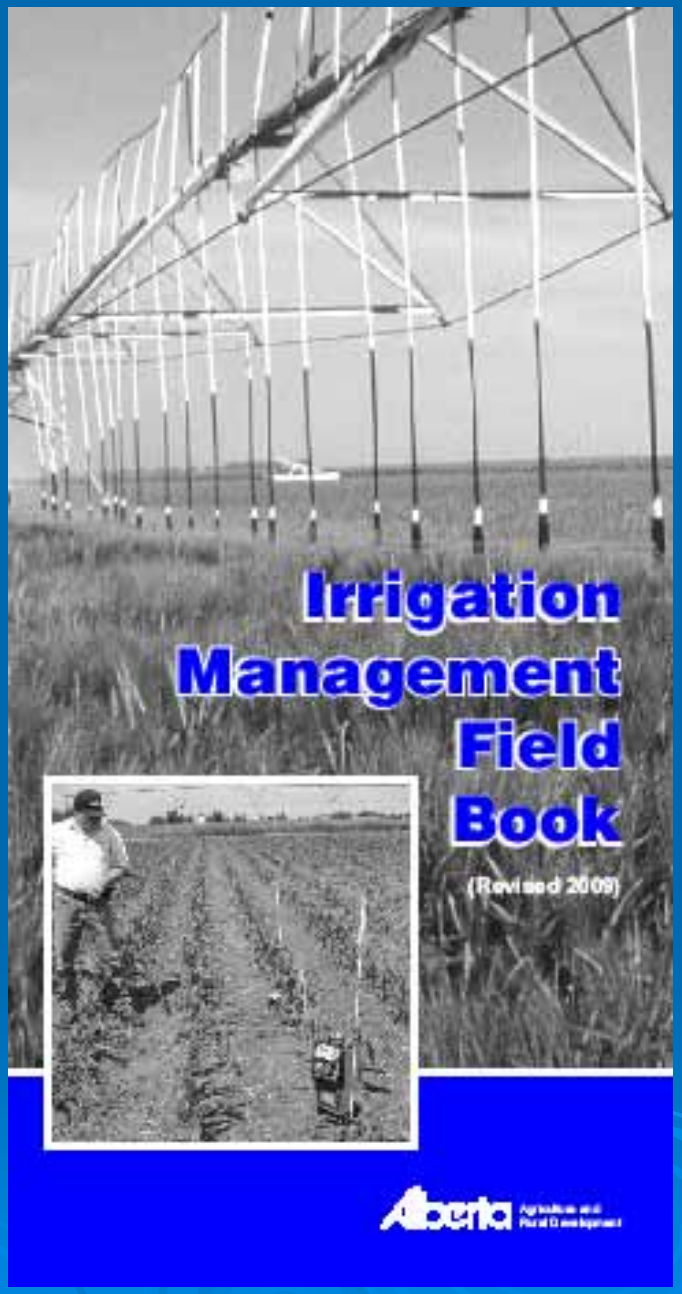
- Soil Auger
- Alberta Ag Field Book
- Calculator
- Paper & Pen
- Rain Gauges
- GUM BOOTS

Some may need:

- Alarm Clock
- Hydration Fluid

- This little book contains all the information you need to Schedule Irrigations.

(Get one from Dave Hyland; his crew is running courses too.)



A Practical Plan

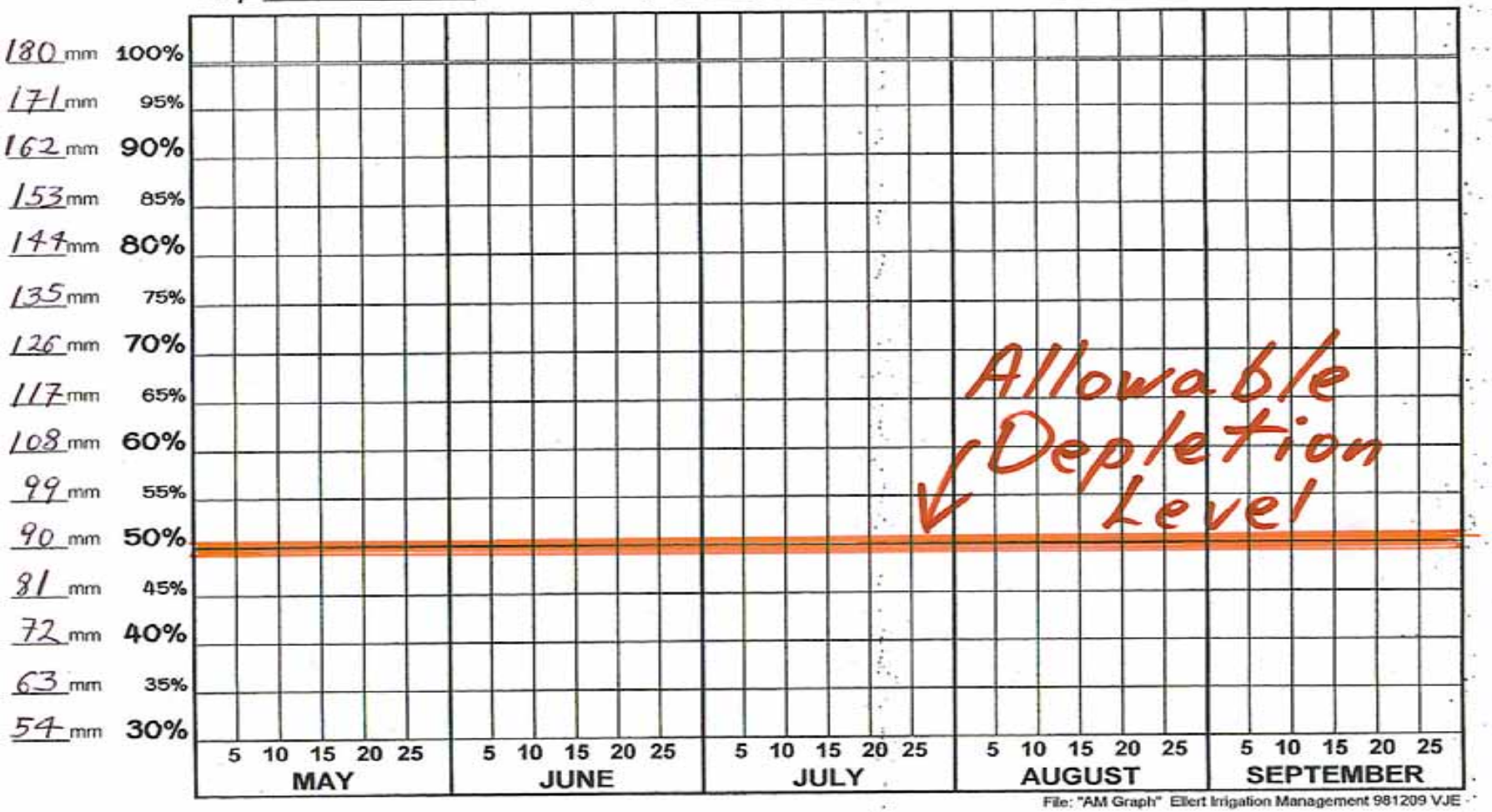
(will be available on website – or call me)

1. Learn what your “Bucket Size” is by sampling your soils with an auger and figuring out the soil texture.
2. Set up an available moisture chart
3. Draw in the allowable depletion level.
   - This is as low as you want the moisture level to go.

Example for "Bucket Size" of 180 mm,

Available Soil Moisture Level

Crop _____ Field _____ Location _____ Year _____



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Steps 4 & 5: Moisture Monitoring

4. Sample your soils at the same time each week and estimate the moisture content,
   - Hand Feel Method is good enough.
   - The accuracy isn't critical
   - Anything is better than a guess (or C.S.M.)
5. Plot your current level on the chart.

PRACTICAL INTERPRETATION CHART FOR AVAILABLE SOIL MOISTURE

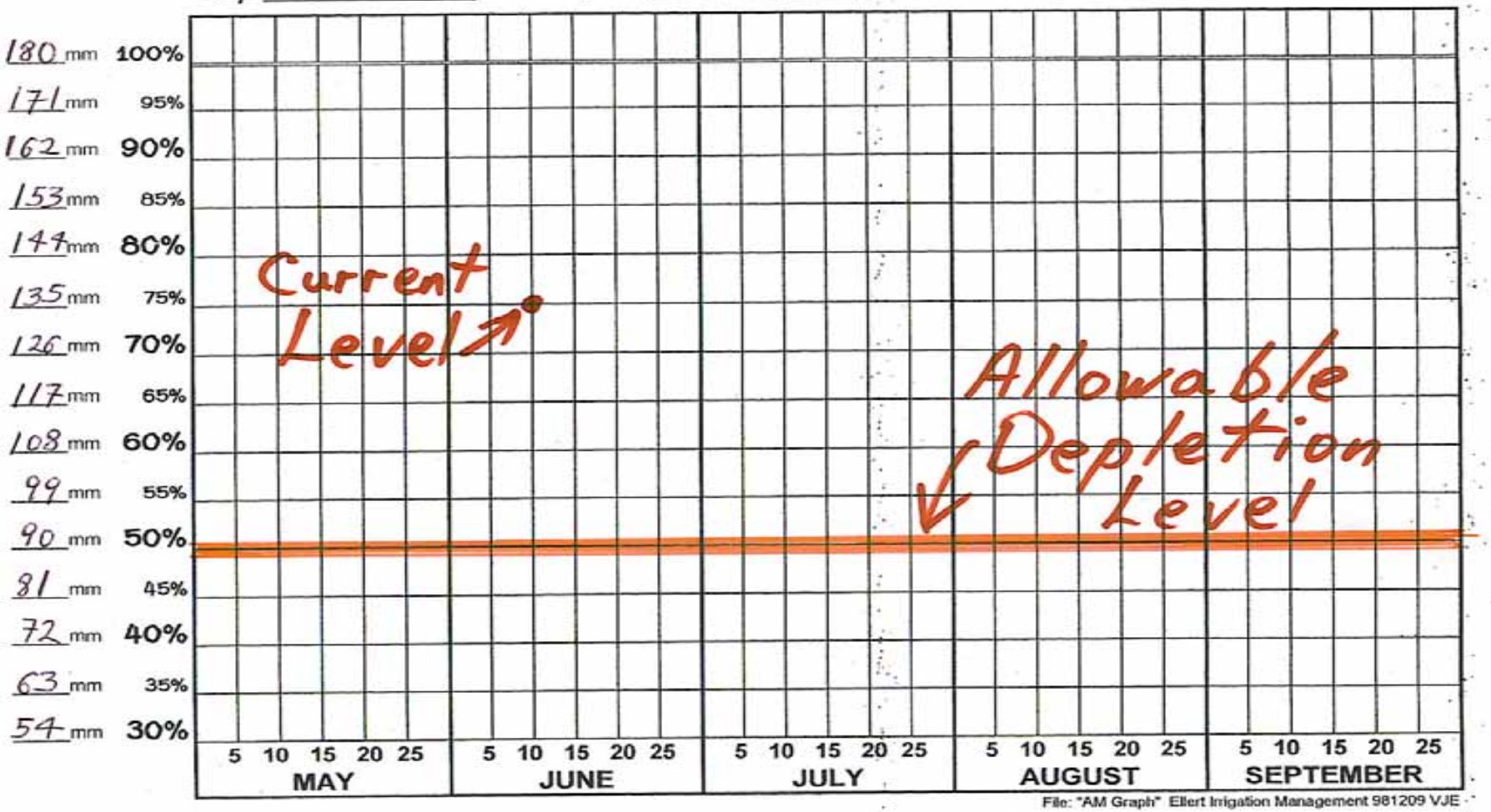
	FEEL OR APPEARANCE OF SOILS			
	PERCENT OF AVAILABLE MOISTURE REMAINING	COARSE TEXTURE (SANDY LOAM)	MEDIUM TEXTURE (LOAM)	FINE TEXTURE (CLAY LOAM)
DO NOT IRRIGATE	100% (FIELD CAPACITY)	UPON SQUEEZING NO FREE WATER APPEARS ON SOIL BUT WET OUTLINE OF BALL IS LEFT ON HAND	SAME AS SANDY LOAM	SAME AS SANDY LOAM
	75 - 100%	FORMS A WEAK BALL, BREAKS EASILY, WILL NOT SLIDE	FORMS A BALL AND IS VERY PLIABLE; SLICKS READILY IF RELATIVELY HIGH IN CLAY	EASILY RIBBONS OUT BETWEEN FINGERS HAS A SLICK FEELING
IRRIGATE SPECIAL CROPS	50 - 75%	TENDS TO BALL UNDER PRESSURE BUT SELDOM WILL HOLD TOGETHER	FORMS A BALL; SOMEWHAT PLASTIC; WILL SOMETIMES SLICK SLIGHTLY WITH PRESSURE	FORMS A BALL WILL RIBBON OUT BETWEEN THUMB AND FOREFINGER
IRRIGATE	25 - 50%	STILL APPEARS TO BE DRY, WILL NOT FORM A BALL WITH PRESSURE	SOMEWHAT CRUMBLY, BUT WILL HOLD TOGETHER FROM PRESSURE	SOMEWHAT PLIABLE WILL FORM A BALL UNDER PRESSURE
	0 - 25%	DRY, LOOSE, SINGLE-GRAINED FLOWS THROUGH FINGERS	POWDER DRY, SOMETIMES SLIGHTLY CRUSTED BUT EASILY BREAKS DOWN INTO POWDERY CONDITION	HARD, BAKED, CRACKED, SOMETIMES HAS LOOSE CRUMBS ON SURFACE

BALL IS FORMED BY SQUEEZING A HANDFUL OF SOIL FIRMLY

Example for "Bucket Size" of 180 mm,

Available Soil Moisture Level

Crop _____ Field _____ Location _____ Year _____



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Steps 6 – 8: Crop Use Budgeting

6. Estimate the crop use using standard data and predict what your level will be in a week.
7. Calculate how much you could apply in the next week.
8. Schedule the next application

AVERAGE DAILY EVAPOTRANSPIRATION FOR IRRIGATED CRC
(APPROXIMATE AVERAGES FOR 10 DAY PERIODS)
mm per DAY

	MAY		JUNE			JULY			AUGU	
	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
ALFALFA	4.3	5.5	6.5	7.1	7.4	7.6	7.5	7.3	6.9	6.3
CORN	1.0	1.3	1.8	2.5	3.4	4.8	5.0	5.7	6.1	6.0
GRASS	3.4	4.3	5.1	5.9	6.5	6.9	7.2	7.1	6.7	6.2
SUGAR BEETS	1.4	2.0	2.0	3.7	4.4	4.9	5.4	5.9	6.0	5.9
WHEAT	1.2	1.9	3.4	5.1	6.7	7.4	7.3	6.4	4.9	3.4
POTATOES	1.4	2.2	3.0	3.8	4.6	5.3	5.8	6.2	6.2	5.8
CANOLA	1.1	1.7	3.2	4.9	6.5	7.4	7.7	7.1	6.0	4.4
BARLEY	1.1	2.2	4.2	6.0	7.1	7.2	6.3	4.9	-	-
FLAX	1.1	1.5	2.5	4.0	5.5	6.6	7.1	6.7	5.7	4.5
PEAS	1.4	2.3	3.5	4.5	5.4	6.1	6.2	6.0	5.2	4.4
DRY BEANS			2.0	2.9	3.8	4.6	5.4	5.7	5.3	4.1
SUN- FLOWERS	1.0	3.0	4.6	5.6	6.3	6.6	6.5	6.0	5.1	4.2

SHARED AREA INDICATES 30 DAYS OF HIGHEST MOISTURE U
VARIATION WILL OCCUR DUE TO CLIMATIC VARIABILITY AND CROF

Example for "Bucket Size" of 180 mm.

Available Soil Moisture Level

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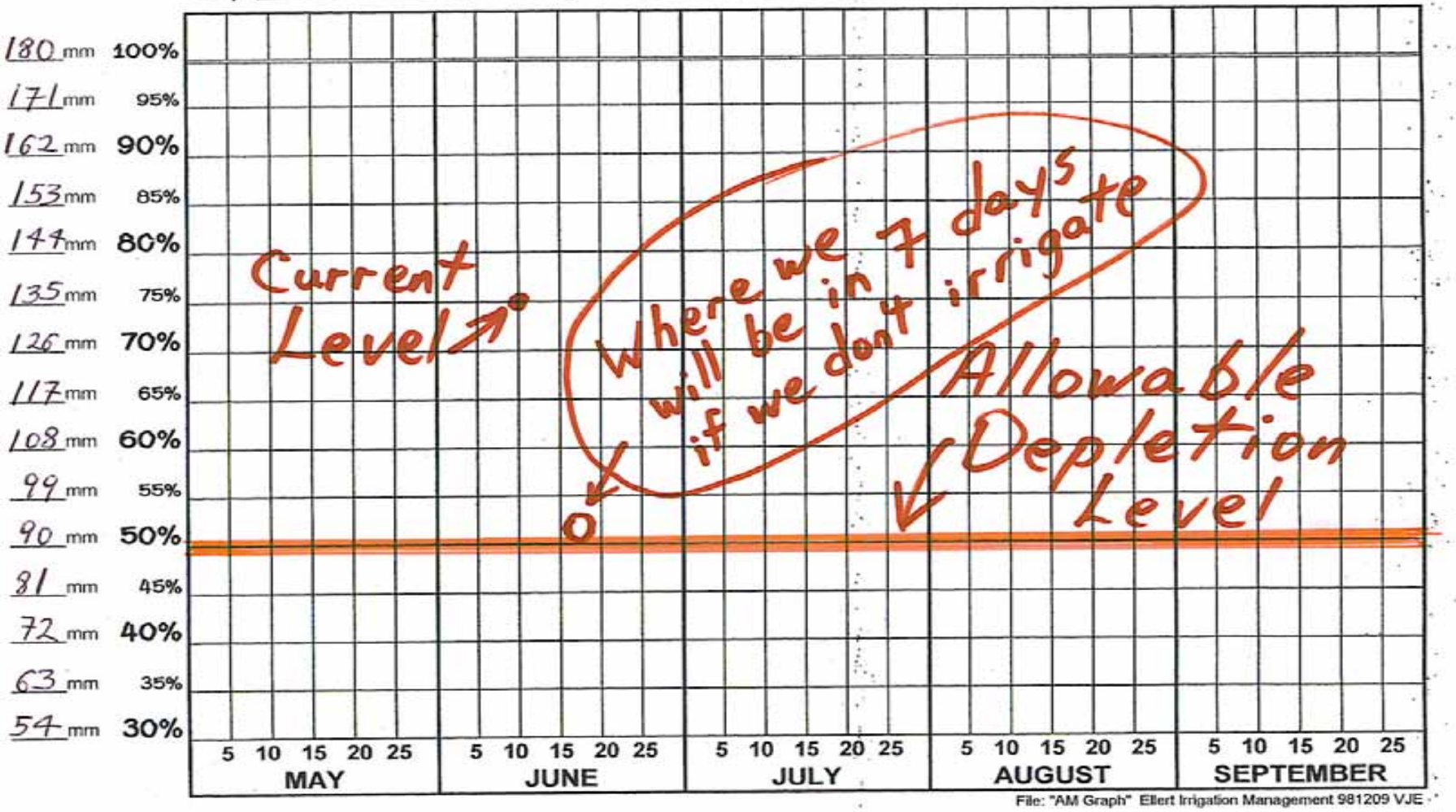

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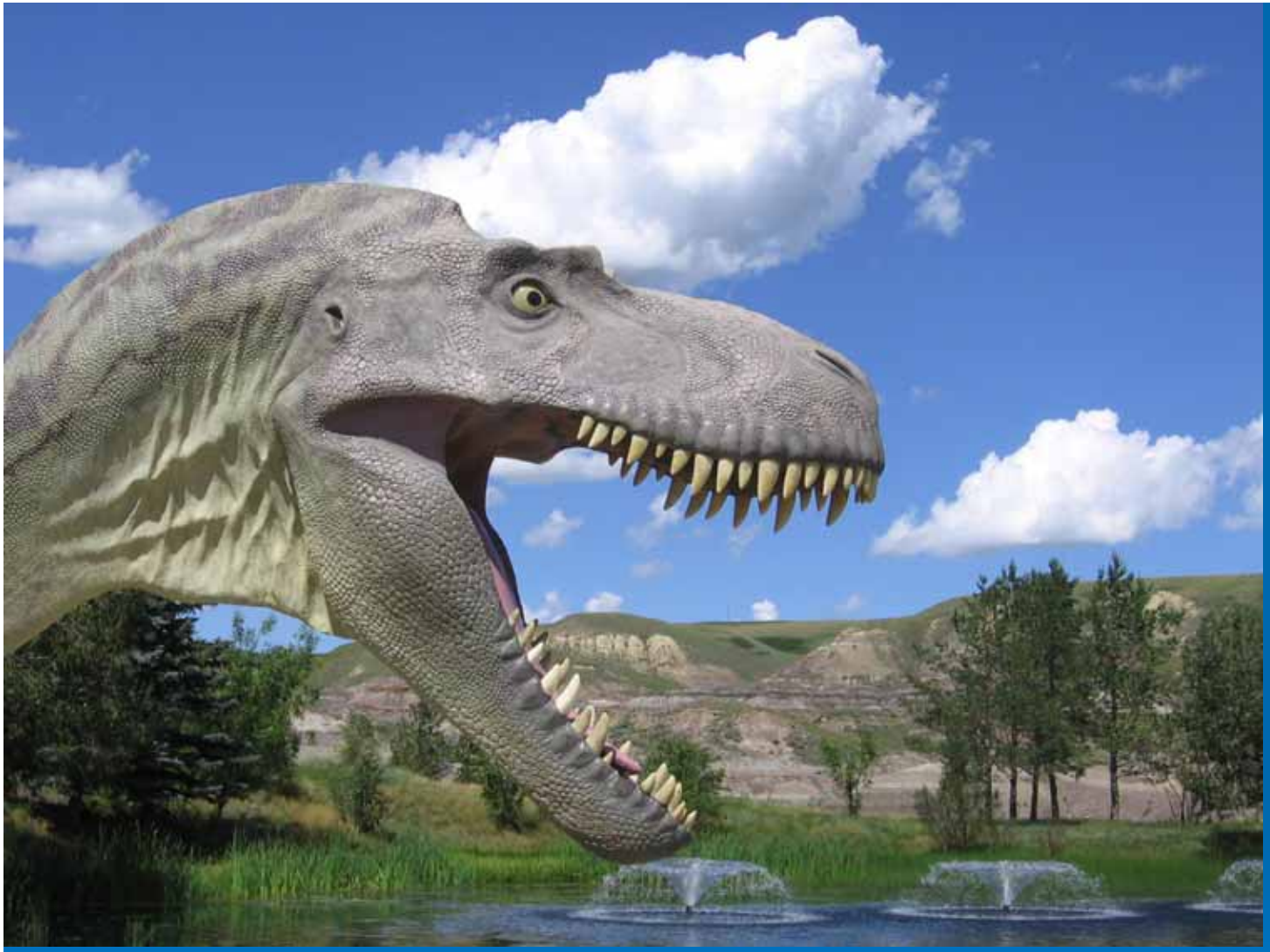
Tips to Make it Work

- Measure your actual applications.
- Don’t try to plan too far in advance.
- Repeat the above steps every week.
- The most important thing is to keep trying.
- Every week is a fresh start. If you miss a week, you can still get back on track.



Now: The Ugly Part

7 Things We Would Rather not Admit

1. The rain you are betting on to save you from irrigating likely won't materialize.
2. Although Crops sometimes use less than standard crop data, you are foolish to bet the farm on it. Sometimes crops will use much more. In general; The data in the book is good
3. Technology won't compensate for lack of management. You can buy management help, but it doesn't have rubber tires.

7 Things We Would Rather Not Admit

4. The situations where we over apply are very rare. Most farmers under irrigate. Irrigation Scheduling usually will tell us to work harder at irrigating.
5. Site Specific tools (where you bury something in one location) do not work as well here as most places in the U.S. due to the high variability of our soils. This fact requires us to cruise the field.
6. Not irrigating to save energy is false economy.
7. The wind sometimes blows in Southern Alberta. You may be getting less into the soil than you think

Where From Here? (Summary)

- These notes will be available.
- Consider taking Dave's course.
- Consider hiring a consultant.
- Any plan is better than none.
- Give it a try; you can do this!

Thank You for Listening!