

alc2 Cncpts,cst,prdctvy

(Overwatered fruit may be
result of overuse of wth
for non-fuel reasons)

With CVP They have probly overest.
 Δ to land values by not figuring reduction of
price of crops due to Δ production. But
This means they under est. Δ to values
in cities & other complements.

(1949)

Tomatoes:

Let soil moisture fall too low
too long, & then wth heavy,
crack or split tomatoes.

Thus supplemental irⁿ
permits better timing of wth,
even when $\frac{1}{2}$ rain plenty, but
poorly timed.

Lemoyne Christiansen - Project Plng & Research.

Stennett - SJ Valley

Mc Garrity - Crop Surveys.

Carroll - Op-ns.

Mrs. Carey, Lib-n.

Xnsn says BR's studies based on Repayment Capacity

This differs from MP not only in being a residual, but
h'g little relation to benefits from applying w. Class 1
land has top repayment cap, but not nec. greatest Δ
output from apply'g w.

Thus rep. cap. is poor index to MP. Is good lvt philosophy
tho — pay on l.v., however derived.

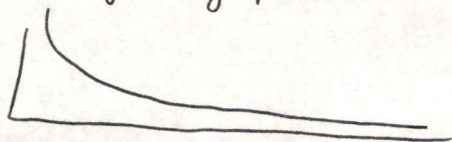
I ask which land class gets priority, if choice betw.
repayment cap. & mp. (note pernicious implns of rep cap. —
richer get w they don't need. BR's phil. of spread'g thin probly
offsets land classif-n tho)

Xnsn's answer: in practise fell back on first come, first served.

Find w, ea. ID keeps its lower than ec. to avoid
outflow. Otherwise might be ec. bring it up to roots. (how about
an opt gnd level, so needn't irrig at all?)

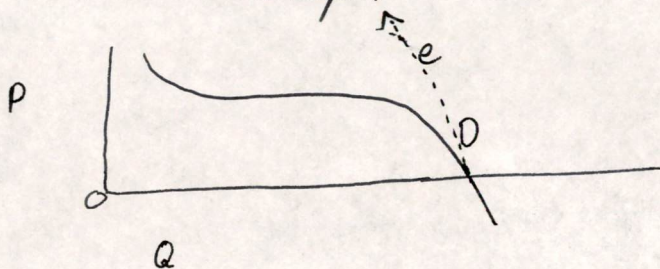
• Fallacy, drawing asymptotic demand curves.

thus:

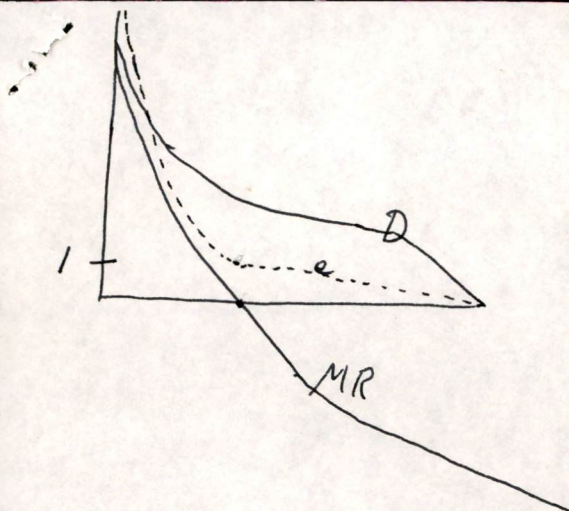


Fact is, many inputs, dim rets go clear thru zero. E.g. water.

More realistic shape:



1/6 wh has garbage or nuisance traits,
you are below or near O -line. ~~stop~~
Low elast. But probly come into zone
of h elast. by ΔP to where
becomes noticeable.

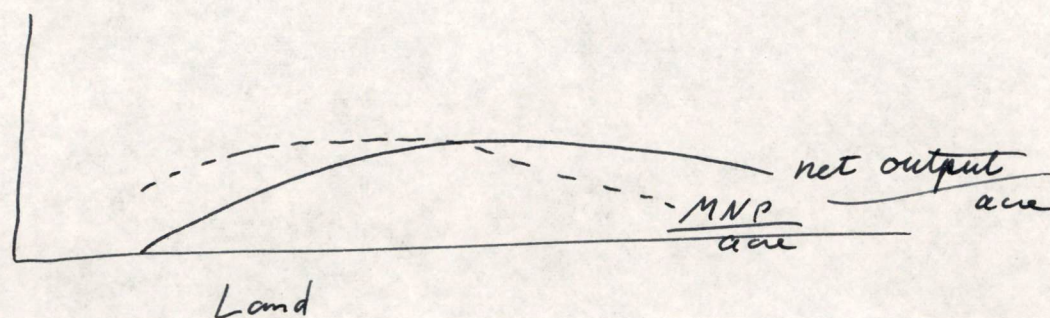
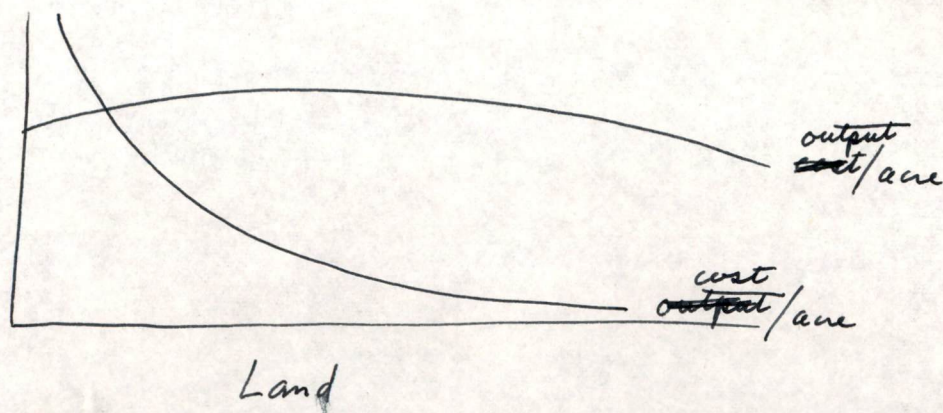


$$e = \frac{\frac{\Delta Q}{Q}}{\frac{\Delta P}{P}} = \cancel{MR} \frac{P \Delta Q}{Q \Delta P}$$

$$MR = P - \frac{P}{e} = P \left(1 - \frac{1}{e} \right) = P \left[1 - \frac{\frac{\Delta P}{P}}{\frac{\Delta Q}{Q}} \right]$$

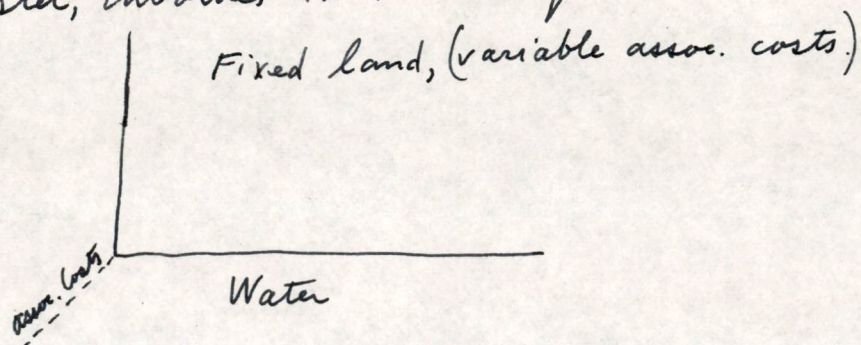
$$= P - \frac{\frac{\Delta P}{\frac{\Delta Q}{Q}}}{\frac{\Delta Q}{Q}} = \frac{P \Delta Q / Q - \Delta P}{\frac{\Delta Q}{Q}}$$

$$= \frac{P \Delta Q - Q \Delta P}{\Delta Q}$$



Above reasoning shows MP land higher, more intensive dev, even where ANP/acre same or lower, & $\frac{b}{c}$ ratio much lower. This must be modified for inter-crop systems probly - holds for a given technology.

Try apply same reasoning to w. Is diff, w. case can be simpler, involves no scale qu.



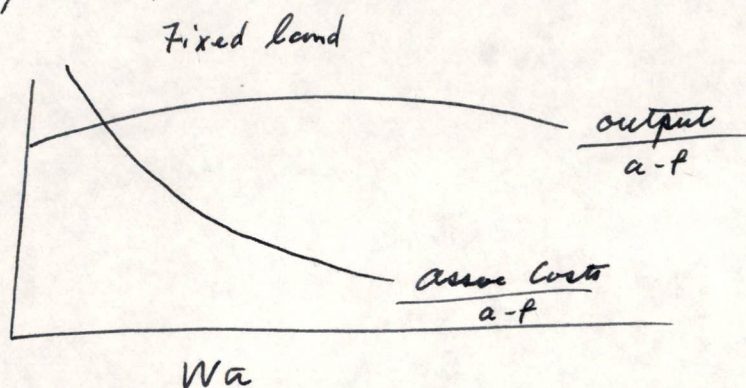
I selected $\frac{\text{output}}{\text{acre}}$ in land case bcs it is familiar, & can get data - move from known to unknown. W. wtr, data come in

$\frac{\text{output}}{\text{acre}}$ where $MP_w = 0$, w. can't w. given per acre, so you get $\frac{\text{output}}{w \cdot a}$ if want, ~~but~~ at given intensities

Bring 3D onto 2 by subtracting Assoc. costs, get ~~MP~~ NP, etc.

But that has no built-in driver-to-point.

I wd be nec. to show that adding w. to intensive op-n lowers assoc costs/a-f, but does not lower output/a-f



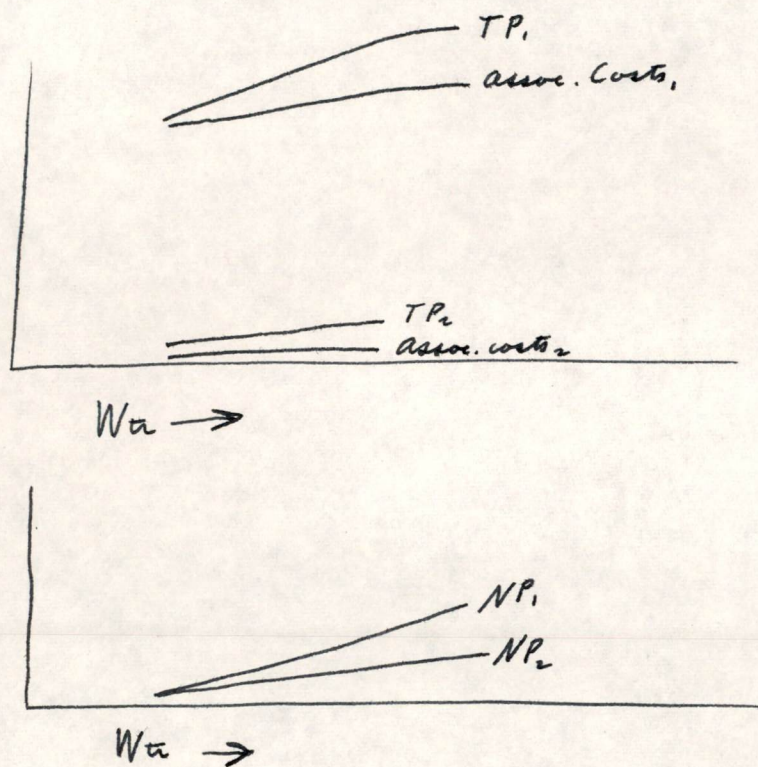
But this has little to do w. intensity of assoc. costs per acre.

Go at it this way — apply w to intensive acre, Δ yield 10%, thus Δ net yield 20%. Better, note this 10% Δ yield is many times greater than 10% on extensive op-n. Prima facie

presumption MP absolutely higher, more intensive op-n. Also less waste between plants, less distrib-n cost — maybe crux, for cd ask why the "per acre" matters, cd. spread over more extensive acres, reach as many plants.

MP land is hi on intensive op-n bcs land is scarce there.
Doesn't follow MP wtr higher there, not for that reason.

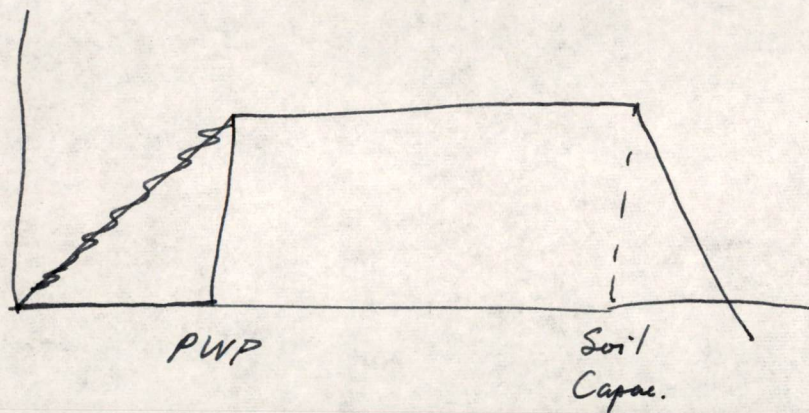
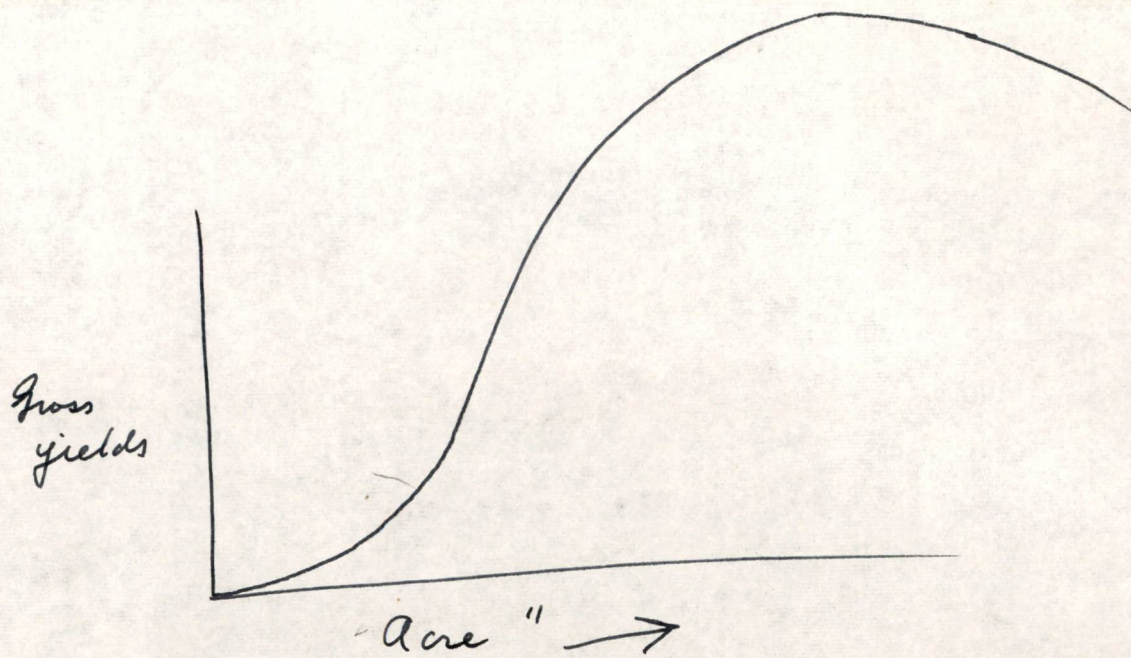
But are reasons, other ones, to think MP wtr higher there.
On intensive acre, Δ l wtr is combined w. more other factors than on extensive one. So higher ratio of complements to wtr there — reasoning on per acre basis.



But specify assumptions. What is fixed besides land? Why doesn't acre 2 add more assoc. costs & become like acre 1?

Work this out. Say the landholder is other fixed item, & curves rep. what 2 diff. ones will do w. wtr. Also fixed is base from which ea. starts, & assume they change w/ a little. Cd. say crop fixed. Land capability fixed, too.
Note steepness of net curve is what counts

But if drop fixed land ass., may be better apply to wider lands — another gn. tho.



Taggart says Veihmeyer pushes theory water does no good until have enough to keep above PWP. Then get same yield however much apply, until reach soil capacity, ... & perhaps afterwards, but get clim. absolute returns.

But others disagree. (Fact of disagreement is itself important, must let individuals work it out)

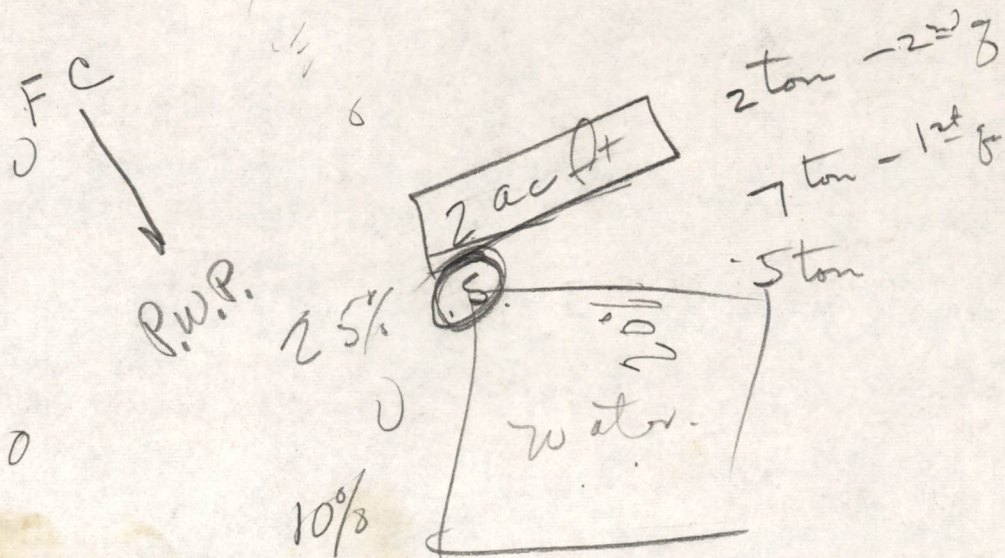
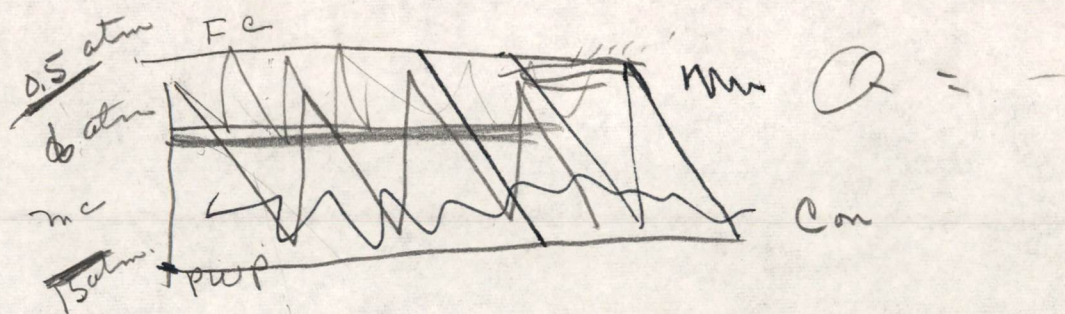
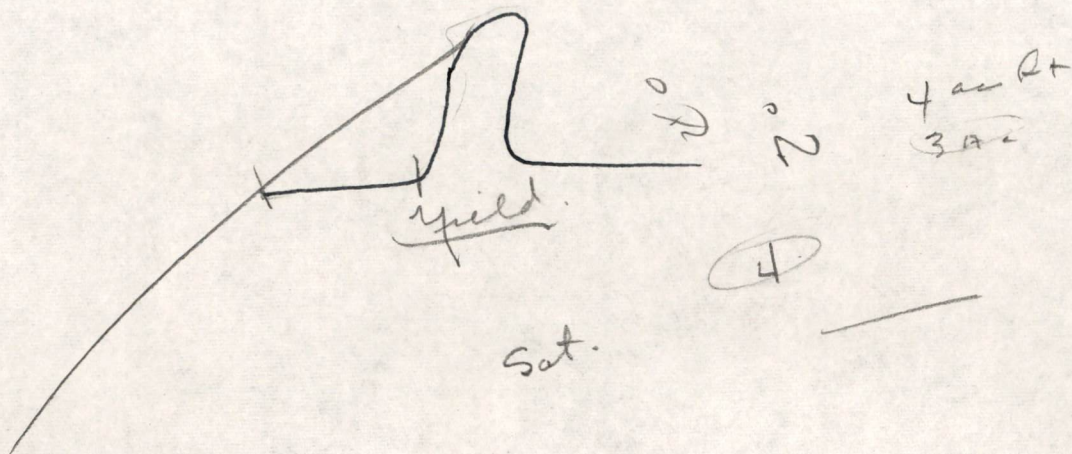
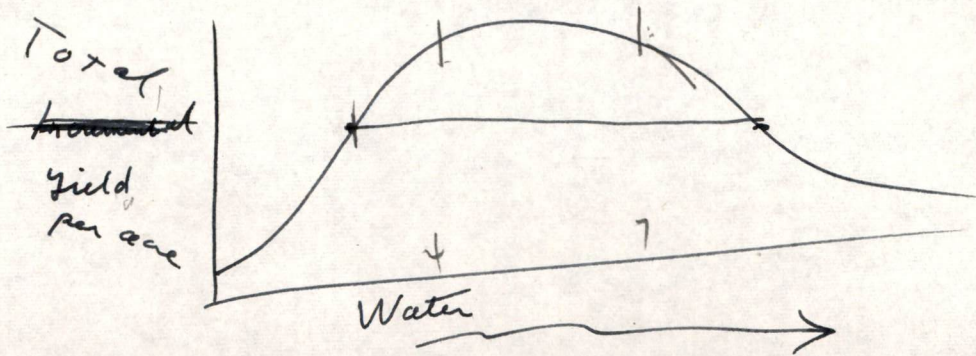
Veihmeyer's view shows in BR, "Memo rpt
Cons. use of w by irrig crops in San SJ Vals.", Land Classif-n &
Land Use Section, Lower SJ Distr., Merced. Revised
5-26-41.

e.g. p. 26, re Carignane Grapes. 2 irrig. methods,
"wet" & "dry" used. "Wet", freq. irrig. kept land near
field capac. "Dry" kept near PWP. Yields same.

(2 pts, not enough draw curve. Maybe peaks in
between)

For lack of MP schedules on individ. crops, get
between - crop data - more water, ~~costlier~~ dearer crops.

W. Stanislaus ID study, dim. ret. study, tomatoes.



Soils vary in moisture holding capacity. When water applied, plant doesn't use it all at once. Soil holds it.

Some soils so good, S. J. valley, can grow melons w/o any irrig., from winter rain. Maybe 20% volume is w.

Others may hold 4%, so when irrig. plant uses it up fast, calls for frequent small irrig.

(Which kind of soil deserves w?)

A plant uses w at same rate, so long as soil moisture exceeds PWP. Says Veihmeyer, others disagree.

And when you irrig., you saturate soil — no middle ground. (I doubt that) Plant uses w same rate, so long as above PWP

So you get same output, once crop pattern is set, however much w. apply. (At least curves become very steep at PWP critical "points")

To raise crop w. less water, space wider, thus use less (but also waste more between plants?)

E.g. of pears. 2 a.-f keeps trees alive, (quite a contribution, itself) last $\frac{1}{2}$ a.-f Δ s weight yield from 2 up to 7 tons, also Δ s grade. John A. McKeag relates this, some area, perhaps Tolson, where BR

is bringing supplemental w. Ask McKeag particulars.
Here is very hi MP wtr.

Taggart has gross outputs & acres for ea. crop, 10s.
But not specific w to ea. such group. Just has
ave. w. demand, various crops. Based on undefined
intensity of culture, vaguely "optimal". Probly ruins things,
avoid using. But are better than I thought, are for one dist.
Belmont - Eastland.

Note, in shrt run, MP's come to diverge very much,
say hvt time, small wtr's at time saves crop.
So need immediately adjustable flexibility. - no time for
adjudications etc.

Approaches to MP:

1. Shift to higher yldg crops. Use Tag's ave. data, on
wtr reqs, see if he has corresponding ave. outputs.
2. Δ output given crop, by more intensity, & maybe more
wtr use per plant
3. Shrt run rescue work.

4. Whole districts - input of w, output crop values,
Other variables wd. disrupt - soil, stage of dev. -
but probly get scatter, fit something to it.

Tag says he applies irrig. effics > found in practice, but thinks he should encourage ec. use. Oriented toward policy & justifying it.

Using gross outputs is obviously inadequate, altho does serve to indicate upper limit of w. value -- try it on rice e.g. Anderson - Cottonwood uses 13. {BR lets its IDs use up to 7. (Find the diff. of yield, if any)}

Method of shifts between crops: ~~appear~~ you do not Δ gross, over 3 a.f. (Truck). So either that is dim. absolute returns; or Δ comes from lower costs. (incl. lower irrig. costs, due to being able to waste more)

Δ may also come b/c surer w. supply lets you gamble more w big inv in high-gross truck crops. (If site is fixed, want max. net, b-c, not max $\frac{b}{c}$ ratio)

Get MP from wells. Get AP from BR's gross figs. Then know if in stage Δ or - Δ s nets, anyway.

Try '50 Irrig. Census, too.

Get Stat. App. to 1956 Crop Reports & related data, Fed-Recl. Progs, BR, Div. of Irrig. Gives acre-output values by projects & crops. E.g. 100, Cachuma; vs. \$100, Orland.

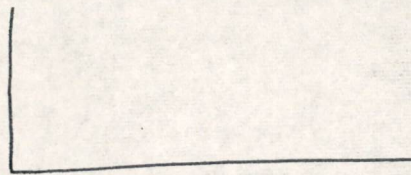
Tag's "Annual Crop Census" notebook has
w deliveries to ea. ID, & Crop values. Get this data, &
give up on MP from this source. But try to get latest
data.

Seems to have nothing on the 4 contracting canal cos.
Too bad. Is ~~avail~~ available?

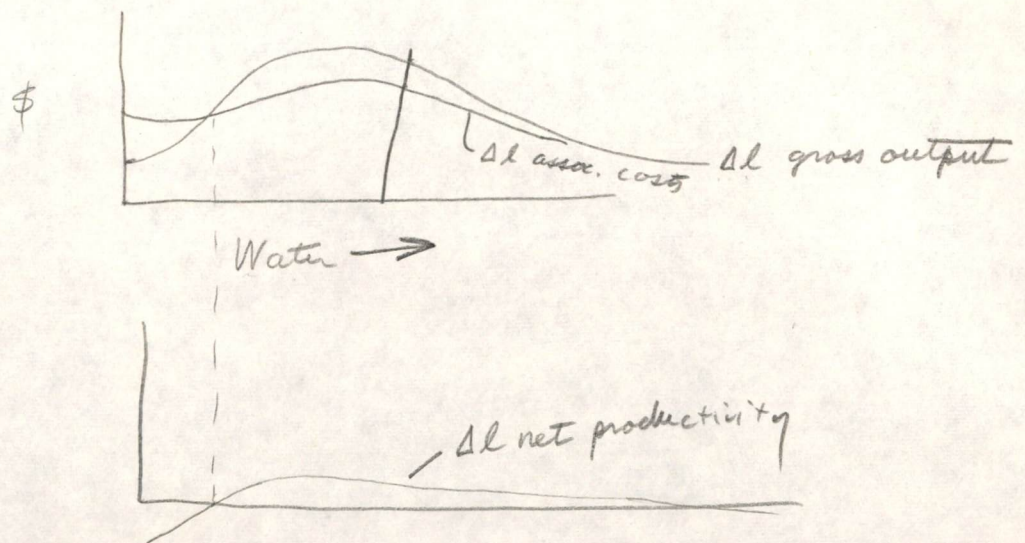
Price practises of ea. ID. — has BR records on? Has
State?

SJ. — rather give me info straight, or have me pick it up
from others less sympathetic to your viewpoint?

MP — if can show mp land higher where higher grass,
can also show it for w. But can you?



Fixed land, variable associated inputs



"Views of Cal Dept WRes" in US Sen Res 281, 84th, 2d. (Mimeo)
11-56.

BB Cir. A-47. Proposed restricting Fed. participation in land & water dev. proj's. Sen Res. 281, 7-25-56, objects to this & later dev's.

p 4 Leland O. Graham was consultant to Sen 789A Comm., 4-9-56.

Write Sac. for this & 3 previous docs cited p 3, all begin 'Views of ...'

p 4 Cal. w use approxs all dom. use U.S.

p 5 '56 Cal Leg. Act, creates Dept WRes, 7-5-56. Consolidates State Eng, Div. WRes, State WRes Bd, & W Project Authority.

p 6 Cong. has never set uniform criteria for eval'g proj's.

So agencies have. 5-50 rpt F1-ARBC; BBA-47, 12-31-52;

House Doc 315, 84th, 2d, which is "WRes Policy", by Pres. Adv'y Comm.

Cal likes Section 6 of Hs Doc 315.

p 8 Pro b/c ratio to cf. proj's. But conceive that some of each are immeasurable, hence not in ratio, & shd be laid out liberally.

p 11-12. Use higher i for pvt ben. & assoc. costs.

p 12 50yr max. horizon. (What wd this do to tree farms?)

p 14 Dept WRes is study'g how value recreation.

p 16 Rpt just finished study of impact of constr. on local govt.

Concludes costs > ben !! --- taxwise, i.e. Implies U.S. shd subsidize locals!

Views of Cal, p 2

p. 17. Prefer annualizing costs & ben. as means of cfy.

p. 18-19. Separable costs, allocate remaining jt costs.

p. 21 Tolerate selling power above cost - sell at max. mkt value.

also sell mun-ind w. higher. Sell cheap irrig w. Double talk - up to now hv bn. pretty rational.

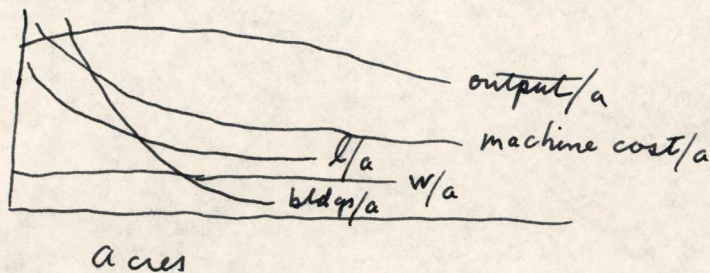
Vs. Callbran formula - pay int-biz costs 1st, then pay irrig-n costs.

By showing w/a & $labor/a$ ^{& output/a}, I am showing combo of ~~some~~ 3 inputs
 - by refering ea. of 2 vbles to a 3d. Can I extend this?

Yes, by implicitly assuming you've solved it for ea. combo of another input.

Trouble w usual theoretical indiff. map constructs is they show all the unec. combos too, thus clutter up chart.

I.

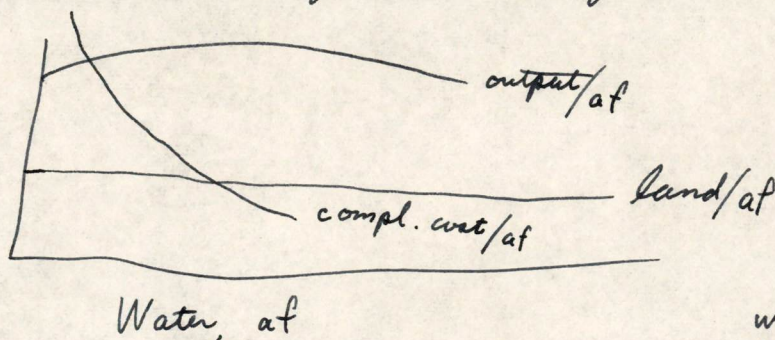


Above lets all inputs vary, thus handles scale + prop-ns.

Takes ea. acreage, assumes you find best combo for that acreage. -
 thus is summation of optima of many studies. ^{also, fits in w. common perceptions & measures.}

Now, how use technique to help find map of wtr?

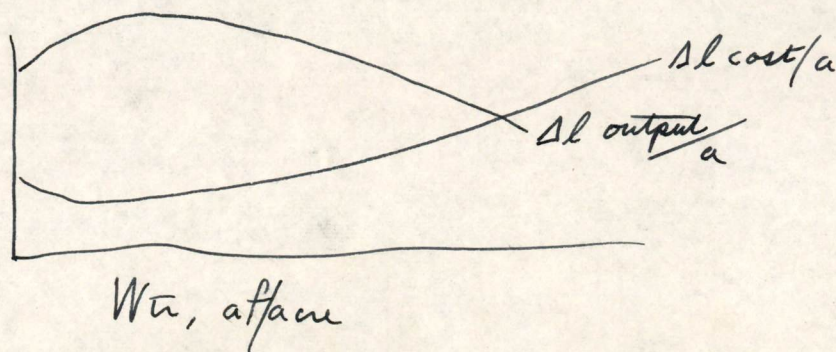
II.



This works out same as I, & makes same point. But introduces scale where not so relevant - well, it is relevant, but first I want to assume all opt scale & work out on that basis.

For that, use III.

III.



Leg

BR. The Contribution of Iron & CVP to the Ec. of
the area & nation. By Alex G. Nordholm.
8-55.

Very sloppy - assumes a benefit, demonstrates
nothing. Worth quoting to show how empty is evidence
of results from CVP.

Big Corn Boost Seen in Irrigation

160 With Fertilization

CHICAGO, Feb. 12 (AP) — Corn yields can be boosted 50 to 65 bushels per acre by irrigation plus adequate fertilization, an agronomist reported today.

Addressing a joint meeting of Midwestern agronomists and fertilizer industry representatives, Dr. F. E. Shubeck of South Dakota Agricultural college, said:

"In areas where we can get 50 to 60 bushels of corn under dry land conditions, we can expect 100 to 125 bushels under irrigation."

On irrigated soils well supplied with potash, he recommended the use of two to three times as much nitrogen and about twice as much phosphate as for dry land.

Soil scientists from 13 Midwest land grant colleges, fertilizer industry men, farm implement manufacturers and representatives of allied industries are attending the meeting sponsored by the National Plant Food institute.

Dr. C. M. Woodruff, University of Missouri soil scientist, told the group that nitrogen does a better crop feeding job when the soil is well supplied with phosphate and potash fertilizer.

He said this was demonstrated in tests at the Sanborn Experimental field, Columbia, Mo., where sudan grass was used as the yardstick for measuring the recovery by crops of nitrogen added to the soil.

quested that
neer be present at the next meet-
ing to testify on safety factors
involved.

K. C. Firm Gets City Copper Pipe Contract

The office of the city purchasing agent has awarded a contract for \$4,968.63 for 12,060 feet of three-quarter inch and one-inch copper pipe for the Water and Light department to the Mid-State Supply company of Kansas City, lowest and best of five bidders.

Two Vehicles Collide On a Rural Road

A station wagon driven by Leon Stephens, 219 South Sixth street, a rural mail carrier, collided with a bread truck driven by Thomas Hughes, Sunset Trailer court, four miles East of Columbia on Richland road about 1:30 p.m. today.

The collision occurred on the crest of a hill. Both vehicles were extensively damaged. Stephens was uninjured but Hughes complained of an injury to his side.

y Crashes aica Coast

2 into the sea about eight miles outside Annotto Bay. The bay is 40 miles from Kingston.