Determining the Economic Value and Viability of a Rice Hybrid

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This presentation can be viewed

and a DVD (NTSC or PAL)

purchased with audio commentary

at

www.HybridRiceEconomics.com

A Methodology

- Avoid the launch of a non-viable hybrid

- Establish a seed price that benefits all involved

- Visualize the costs and benefits of a new hybrid relative to a viable, competing product

- Applicable across countries, currencies and cultivation systems
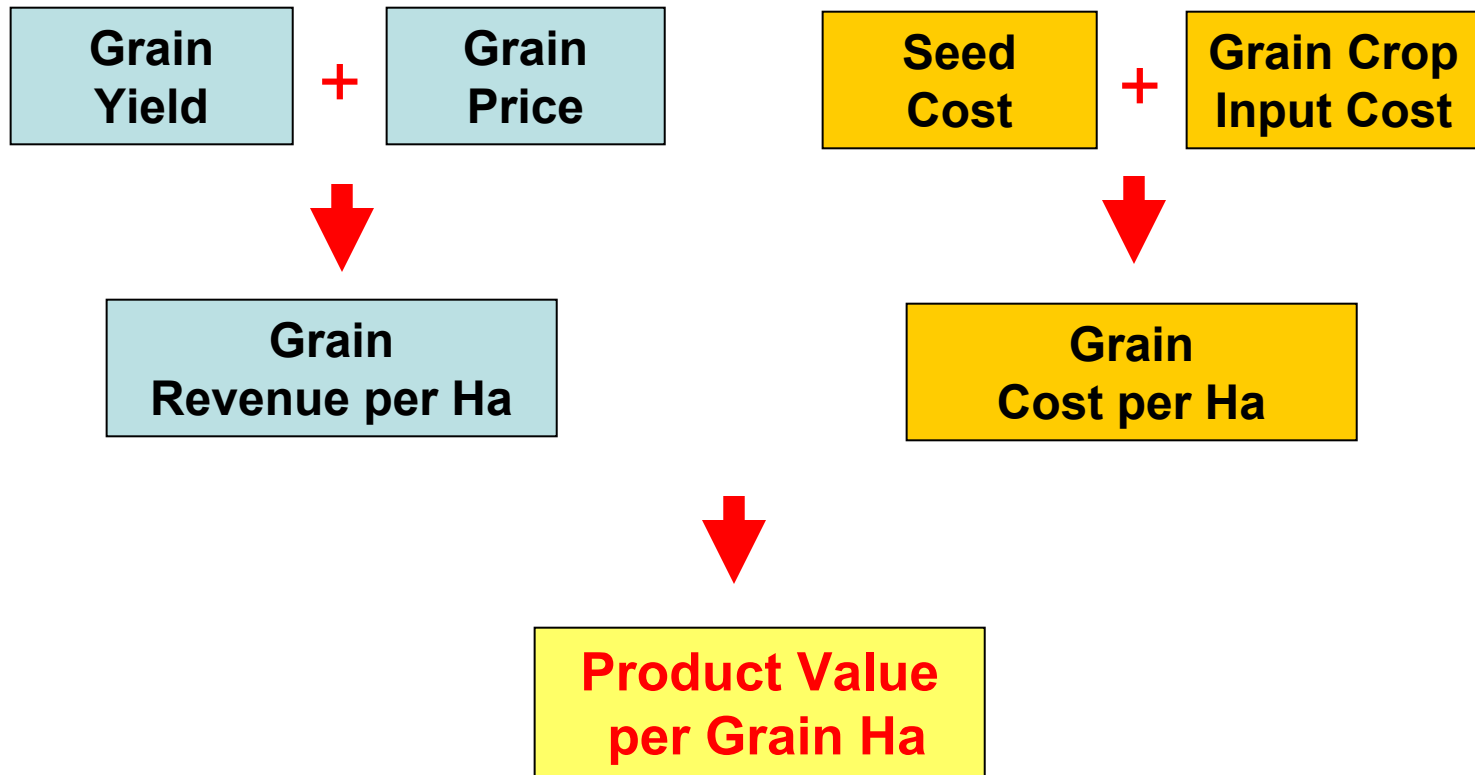
Core Principle

Consider
seed production, grain production and *grain sale*
as a single economic system

Basic Method

STEP 1: MEASURE *SYSTEM-WIDE* PRODUCT VALUE

STEP 2: SHARE THE *ADDED VALUE*

Product Value

Grain Yield	**+**	Grain Price

⬇

Grain Revenue per Ha

Seed Cost	**+**	Grain Crop Input Cost

⬇

Grain Cost per Ha

⬇

Product Value per Grain Ha

Basic Method - Step 1

MEASURE *SYSTEM-WIDE* PRODUCT VALUE

- Express all costs and benefits as grain yield equivalents …. kg per grain hectare

- Determine the Added Value of the hybrid relative to the competing product across the system …in kg per grain hectare

Express Seed Cost as a Grain Yield Equivalent – Example

- Seed cost to seed producer is $2.63 per kg of seed

- Seeding rate in grain field is 35 kg seed per ha of grain

- Grain price is $0.20 per kg of grain

- Seed cost is $$\frac{\$2.63 \times 35}{\$0.20} = 460 \text{ kg grain per ha grain}$$

  Grain Yield Equivalent

Why Express Costs and Benefits in Grain Yield Equivalents?

- Easy to think of each grain cost item as the quantity of harvested grain required to pay for the item

- Easy to make international comparisons of hybrid performance, costs and prices

Basic Method – Step 2

SHARE THE *ADDED VALUE*

- Create two economic entities, a seed producer and a farmer, and divide or share the *Added Value* between them, to generate a seed price

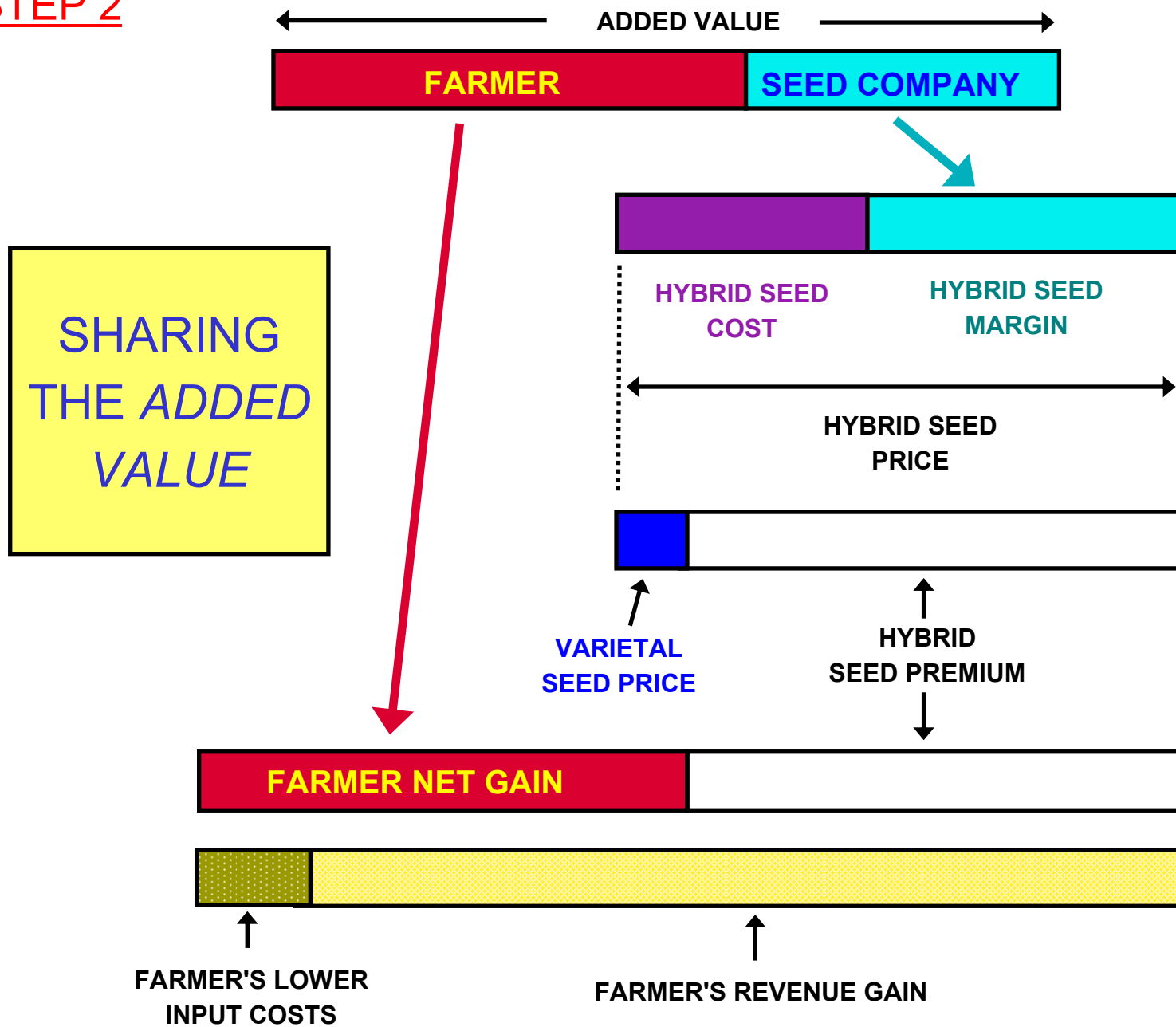- Assess the hybrid viability for the seed producer and the farmer at different seed prices

Example 1 - Hybrid Added Value
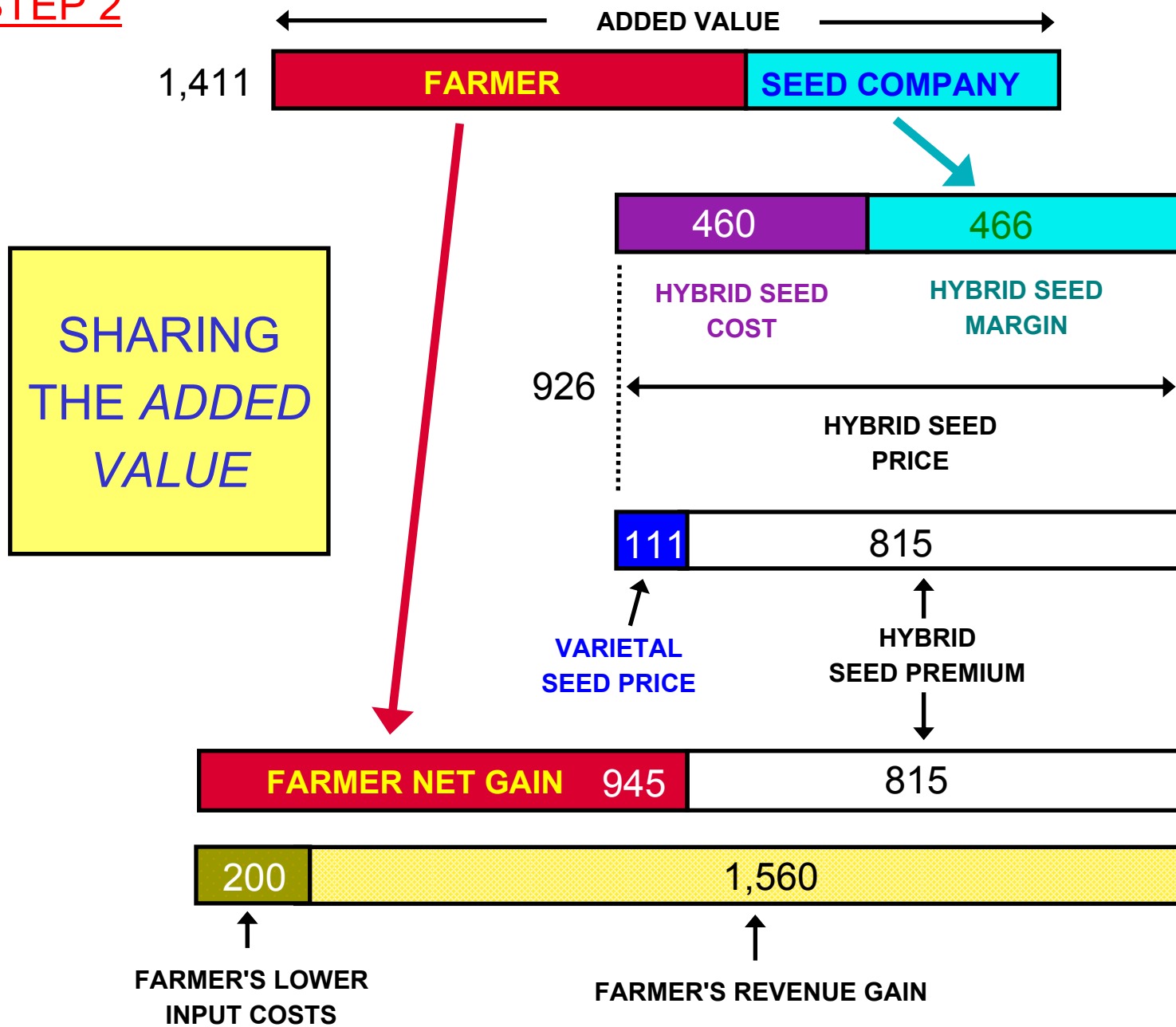
relative to a Variety – kg per grain ha – grain $200/t

	HYBRID	VARIETY	DIFFERENCE
(i) Grain Yield	9,000	7,480	1,520
(ii) Grain Price	50	10	40
(iii) Seed Cost	(460)	(111)	(349)
(iv) Grain Input Cost	(6,275)	(6,475)	200
HYBRID ADDED VALUE			1,411
Memo: Revenue (i)+(ii)	9,050	7,490	1,560

Example 1. Grain $200/t

STEP 2

ADDED VALUE

FARMER	SEED COMPANY

SHARING
THE *ADDED*
VALUE

HYBRID SEED
COST

HYBRID SEED
MARGIN

HYBRID SEED
PRICE

VARIETAL
SEED PRICE

HYBRID
SEED PREMIUM

FARMER NET GAIN

FARMER'S LOWER
INPUT COSTS

FARMER'S REVENUE GAIN

STEP 2

ADDED VALUE

1,411 — **FARMER** | **SEED COMPANY**

460 | 466

HYBRID SEED COST | HYBRID SEED MARGIN

SHARING THE *ADDED VALUE*

926 — HYBRID SEED PRICE

111 | 815

VARIETAL SEED PRICE

HYBRID SEED PREMIUM

FARMER NET GAIN 945 | 815

200 | 1,560

FARMER'S LOWER INPUT COSTS

FARMER'S REVENUE GAIN

Hybrid Seed Price Changes
as Share of Added Value Changes

Farmer	Seed Producer	Farmer Advantage	Seed Producer Margin = X	Hybrid Seed Price X + Y	Seed Producers Margin
Share of AV	Share of AV	kg/grain ha	kg/grain ha	kg/grain ha	% of price
33%	67%	466	945	1,405	67%
50%	50%	706	706	1,166	61%
67%	33%	945	466	926	50%

Hybrid Added Value   1,411 kg/grain ha

Cost to Produce Hybrid Seed   Y = 460 kg/grain ha

Hybrid Added Value from Example 1. Grain $200/t

Hybrid Seed Price Changes
as Share of Added Value Changes

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Hybrid Added Value   1,411 kg/grain ha

Cost to Produce Hybrid Seed   Y = 460 kg/grain ha

Hybrid Added Value from Example 1. Grain $200/t

Issues in Sharing Added Value
i.e. setting the seed price

Farmer must have a sufficient share of the Added Value to cover performance variability – a problem if the Added Value is low and seed price is high relative to the competing product

Seed Producer must have a sufficient share of the Added Value to cover research and development (or royalties), administration, sales and distribution costs, the cost of capital and profit. The seed prices and Added Value of competing hybrids must also be considered.

Seed Price can be based on Performance Level *and* Variability

- Conduct multiple field comparisons of hybrid and variety

- Find the seed price which results in farmers having positive results, after paying for seed, (say) 95% of time

- Determine the average share of the Added Value for farmer and seed producer at this seed price

- Evaluate if hybrid is viable for seed producer at this price
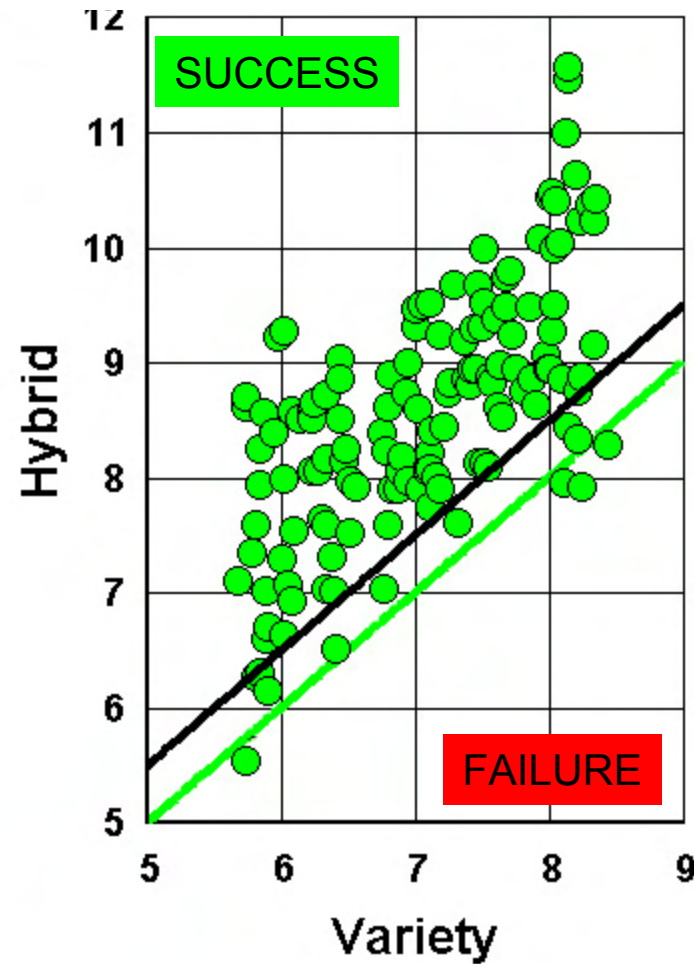
STEP 2

Revenue per Hectare

Thousand kg

SUCCESS
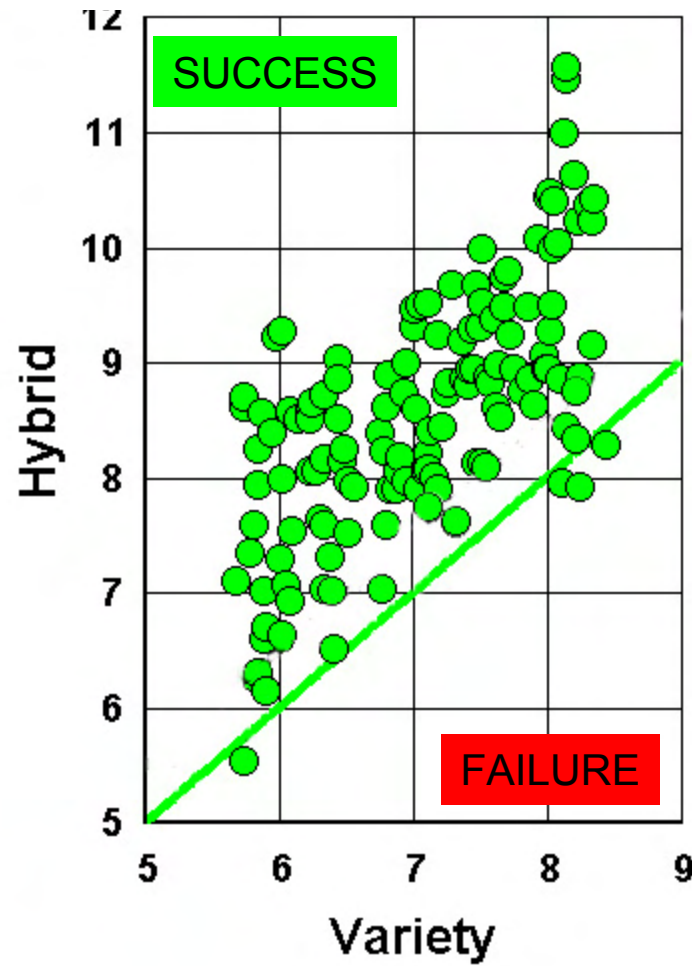
(i) and (ii)

GREEN LINE
HYBRID = VARIETY

FAILURE

(i) and (ii)

Revenue per Hectare

Thousand kg

BLACK LINE
HYBRID = VARIETY
PLUS
SEED PREMIUM (iii)
MINUS
INPUT COST
CHANGE (iv)

We will now use the methodology
to explore the impact of two important
factors: grain price and hybrid seeding rate

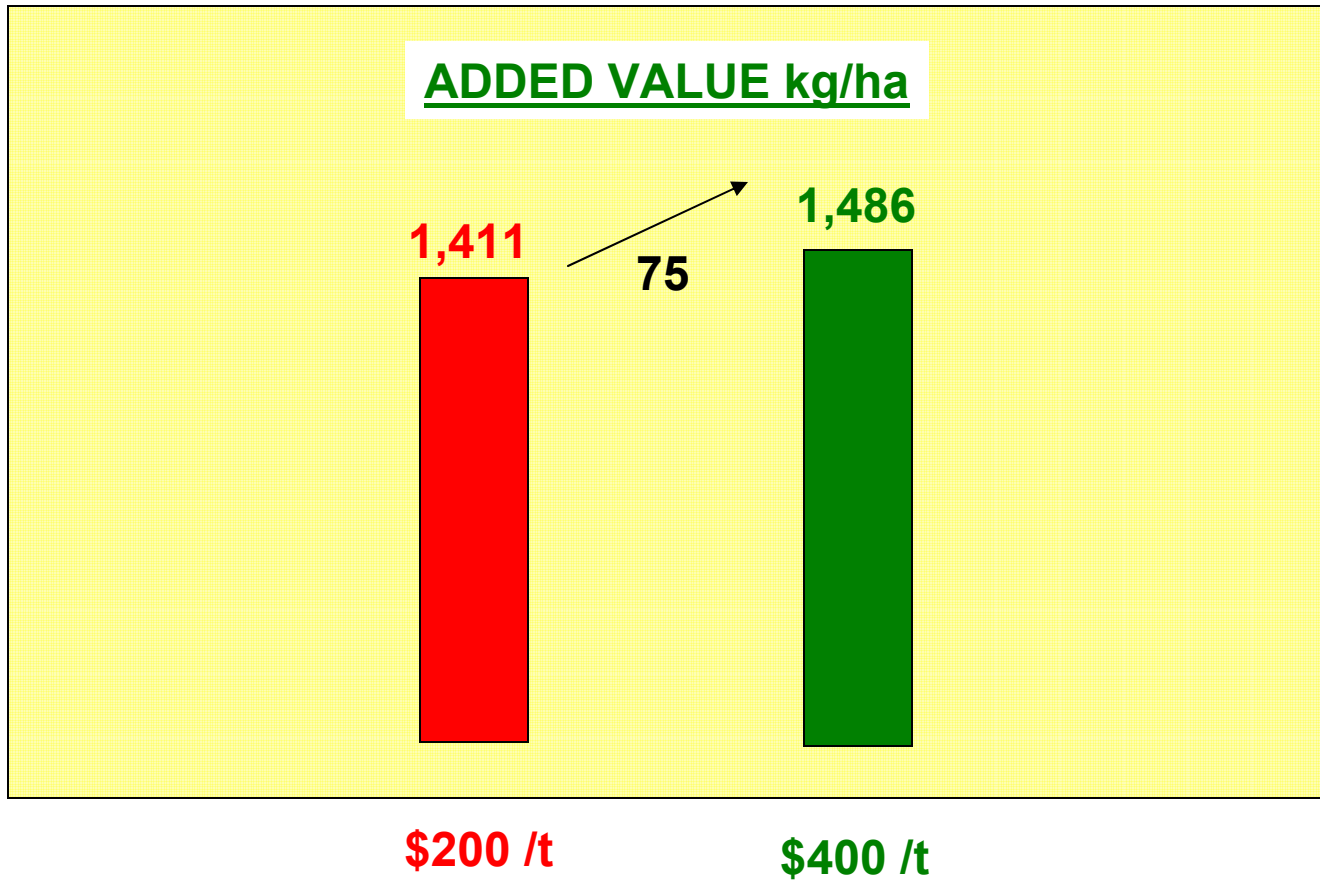# What is the Impact of a Grain Price Increase from $200 to $400/t?

Example 2 - Hybrid Added Value
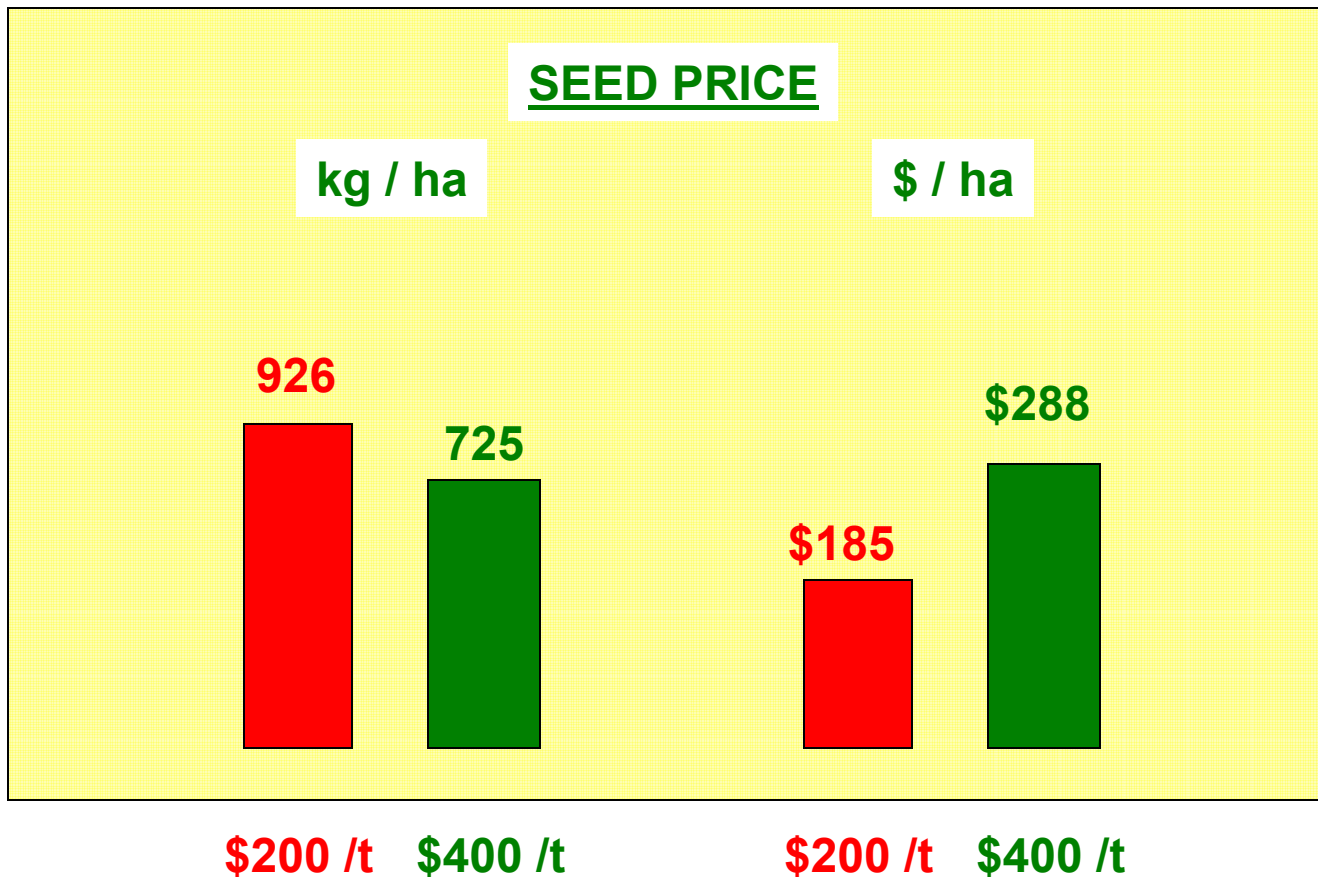
relative to a Variety – kg per grain ha – grain $400/t

	HYBRID	VARIETY	DIFFERENCE
(i) Grain Yield	9,000	7,480	1,520
(ii) Grain Price	50	10	40
(iii) Seed Cost	(230)	(56)	(174)
(iv) Grain Input Cost	(3,138)	(3,238)	100
HYBRID ADDED VALUE			1,486
Memo: At $200/t the HAV is 1,411			
Memo: Revenue (i)+(ii)	9,050	7,490	1,560

Example 2. Grain $400/t

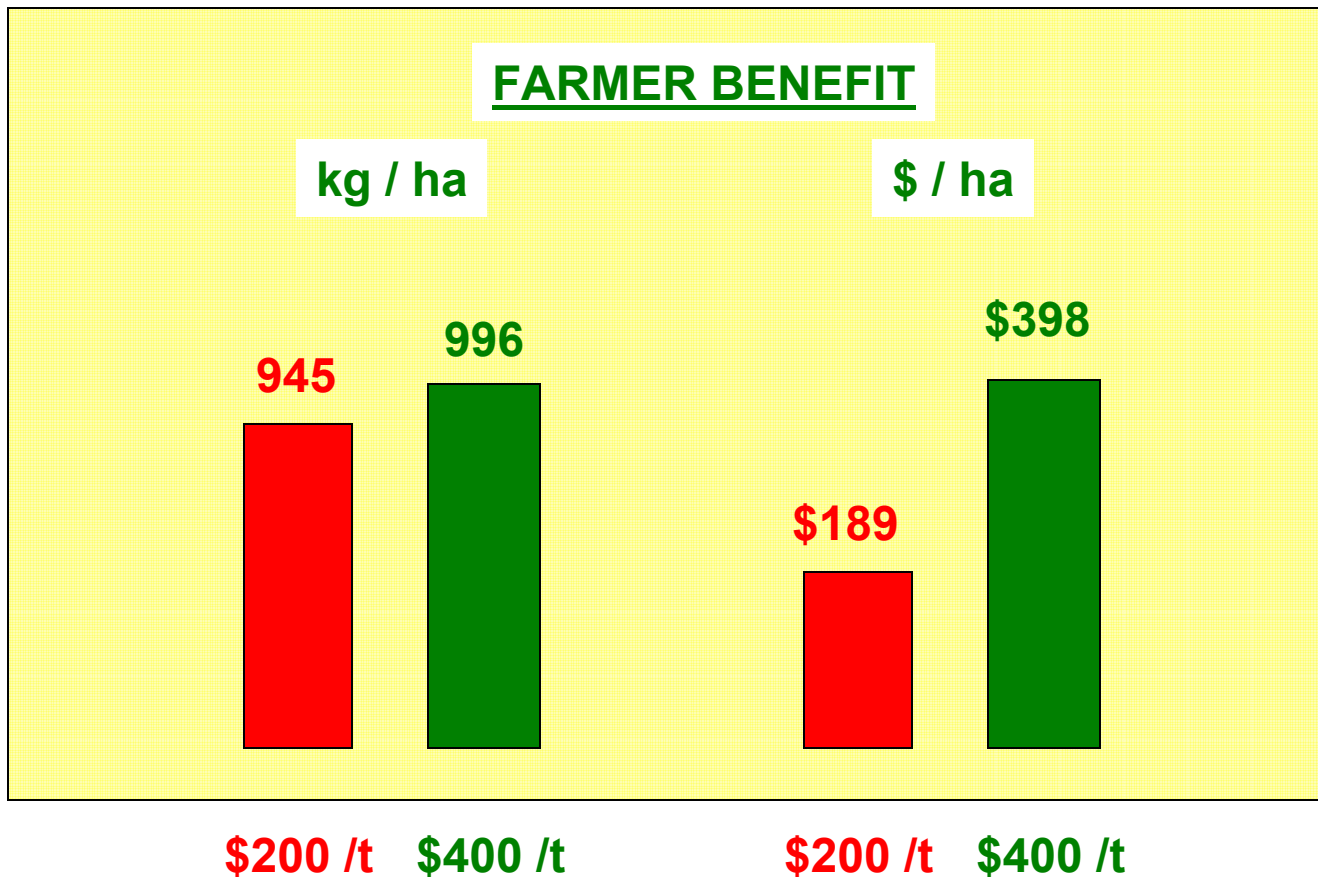# 1 - Impact of a Grain
Price Increase from $200 to $400/t

ADDED VALUE kg/ha

1,411

75

1,486

$200 /t

$400 /t

2 - Impact of a Grain
Price Increase from $200 to $400/t

SEED PRICE

kg / ha

$ / ha

926

725

$288

$185

$200 /t $400 /t $200 /t $400 /t

3 - Impact of a Grain
Price Increase from $200 to $400/t

FARMER BENEFIT

kg / ha

$ / ha

945

996

$398

$189

$200 /t $400 /t $200 /t $400 /t

What is the Impact of a 50% Reduction in Hybrid Seeding Rate?

Example 3 - Hybrid Added Value
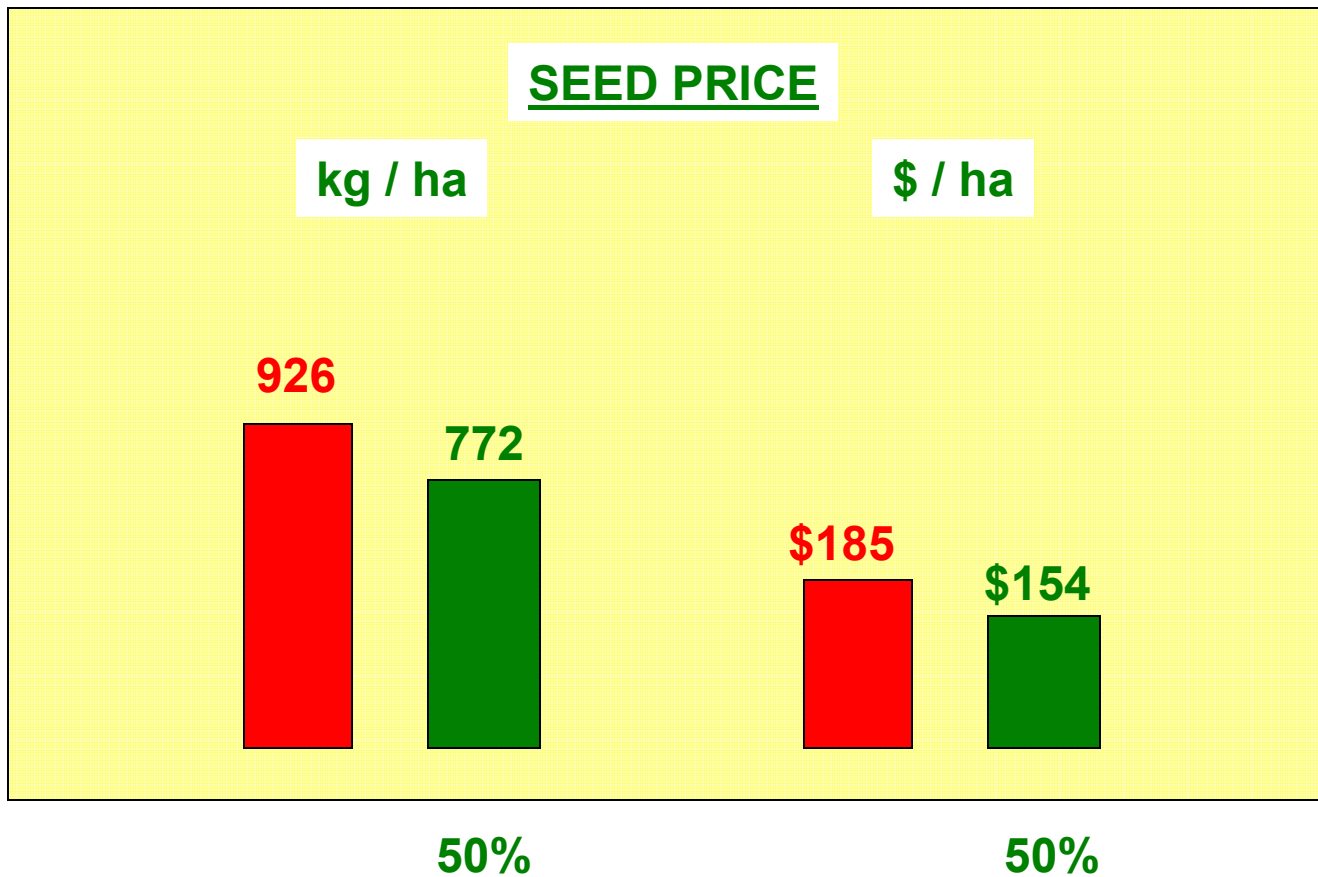
50% lower seeding rate – kg per grain ha – grain $200/t

	HYBRID	VARIETY	DIFFERENCE
(i) Grain Yield	9,000	7,480	1,520
(ii) Grain Price	50	10	40
(iii) Seed Cost	(230)	(111)	(119)
(iv) Grain Input Cost	(6,275)	(6,475)	200
HYBRID ADDED VALUE			1,641
Memo: At the higher seeding rate the HAV is 1,411			
Memo: Revenue (i)+(ii)	9,050	7,490	1,560

Example 1. Grain $200/t

1 - Impact of a 50% Reduction
in Seeding Rate

ADDED VALUE kg/ha

1,641

1,411

230

50%
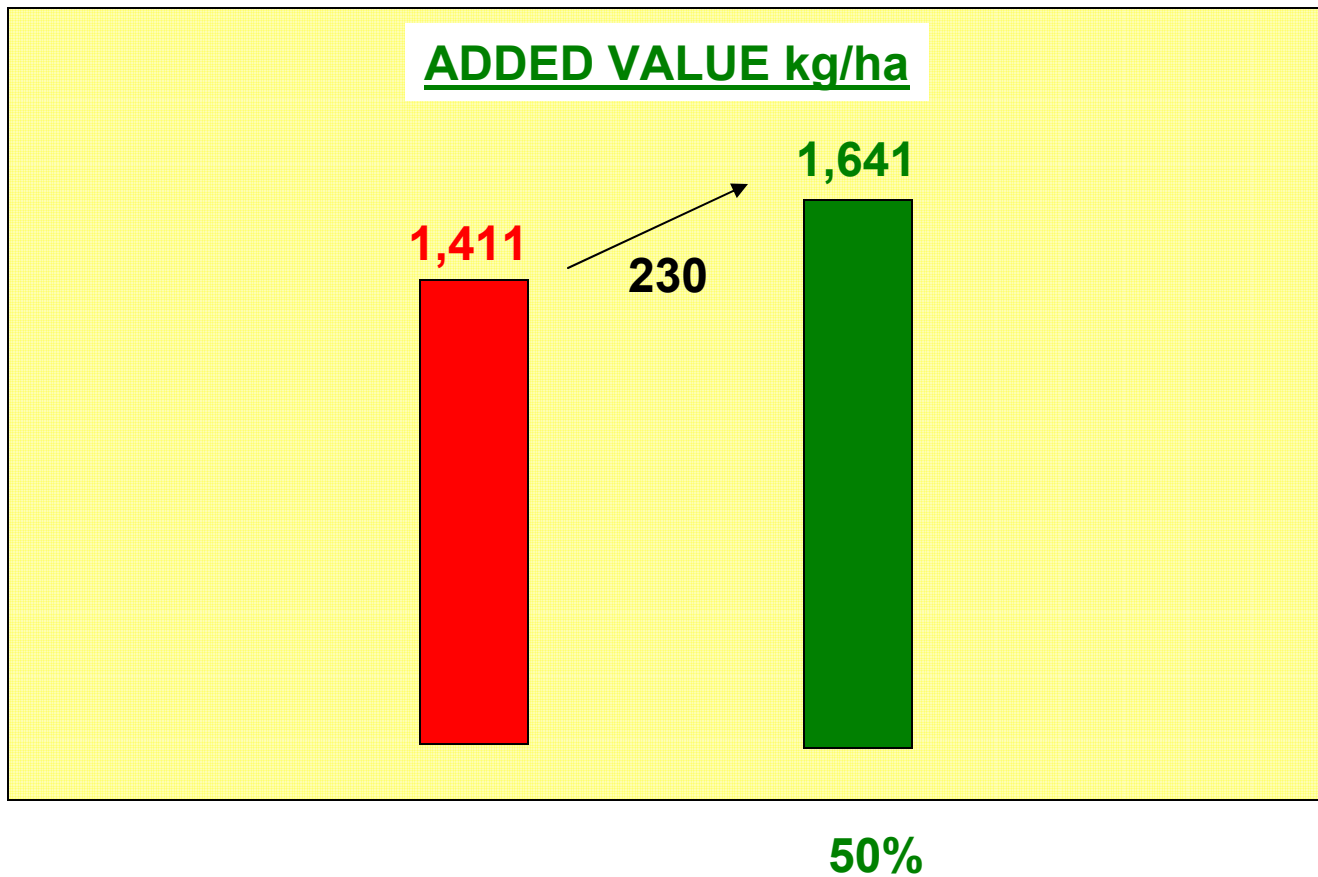
2 - Impact of a 50% Reduction in Seeding Rate

3 - Impact of a 50% Reduction in Seeding Rate

FARMER BENEFIT

kg / ha

$ / ha

1,099

945

$220

$189

50%

50%
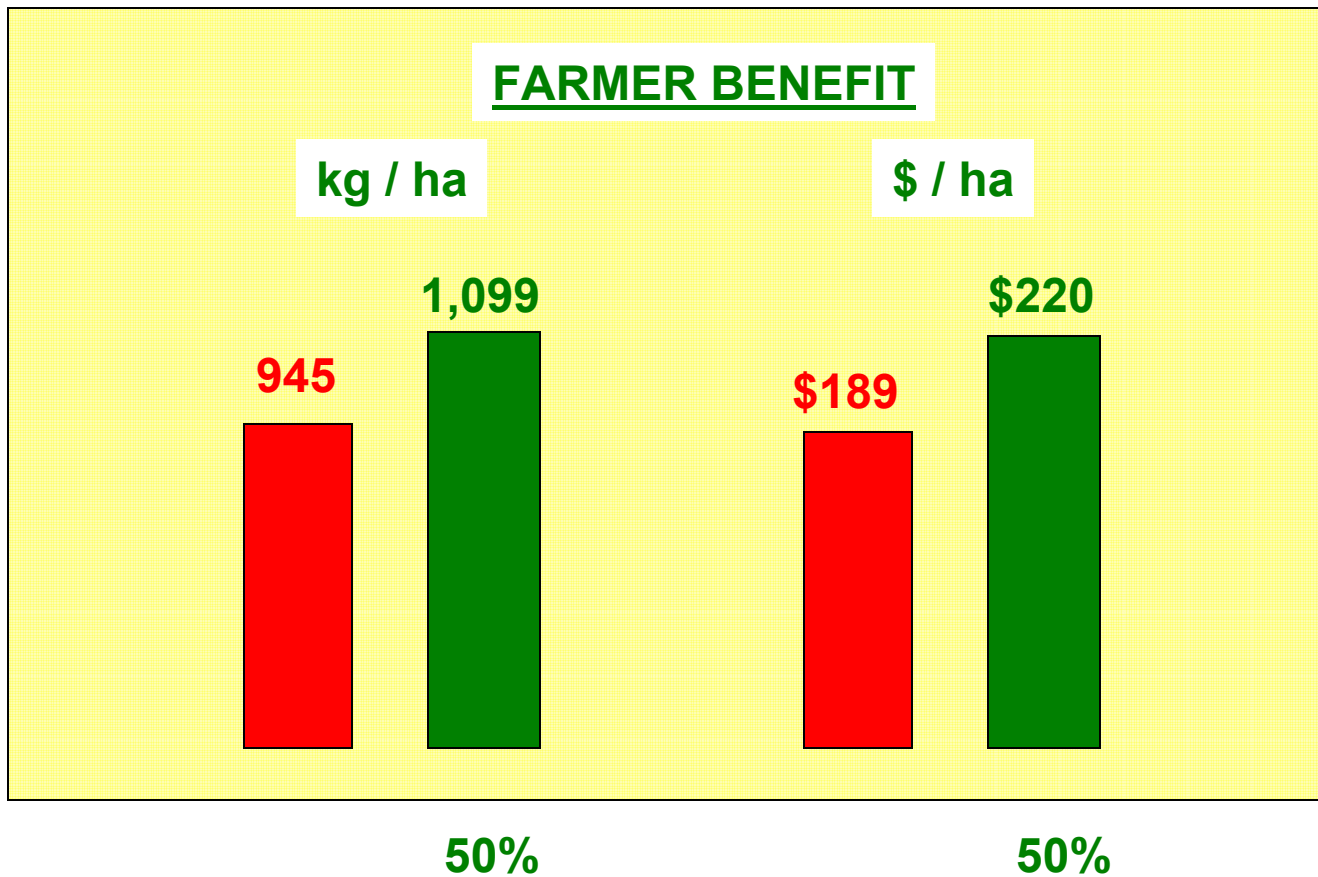
Example 3 - Hybrid Added Value

Comparing two hybrids – kg per grain ha.

	HYBRID 1	HYBRID 2	DIFFERENCE
(i) Grain Yield	9,500	9,000	500
(ii) Grain Price	(279)	(50)	(229)
(iii) Seed Cost	(460)	(300)	(160)
(iv) Grain Input Cost	(6,275)	(6,175)	(100)
HYBRID 1 ADDED VALUE OVER 2			10
1 has higher grain yield but poorer grain quality and a higher seed cost than 2.			
Memo: Revenue (i)+(ii)	9,221	8,950	271

Example 3

The Relative Characteristics
of Different Hybrids can be Charted
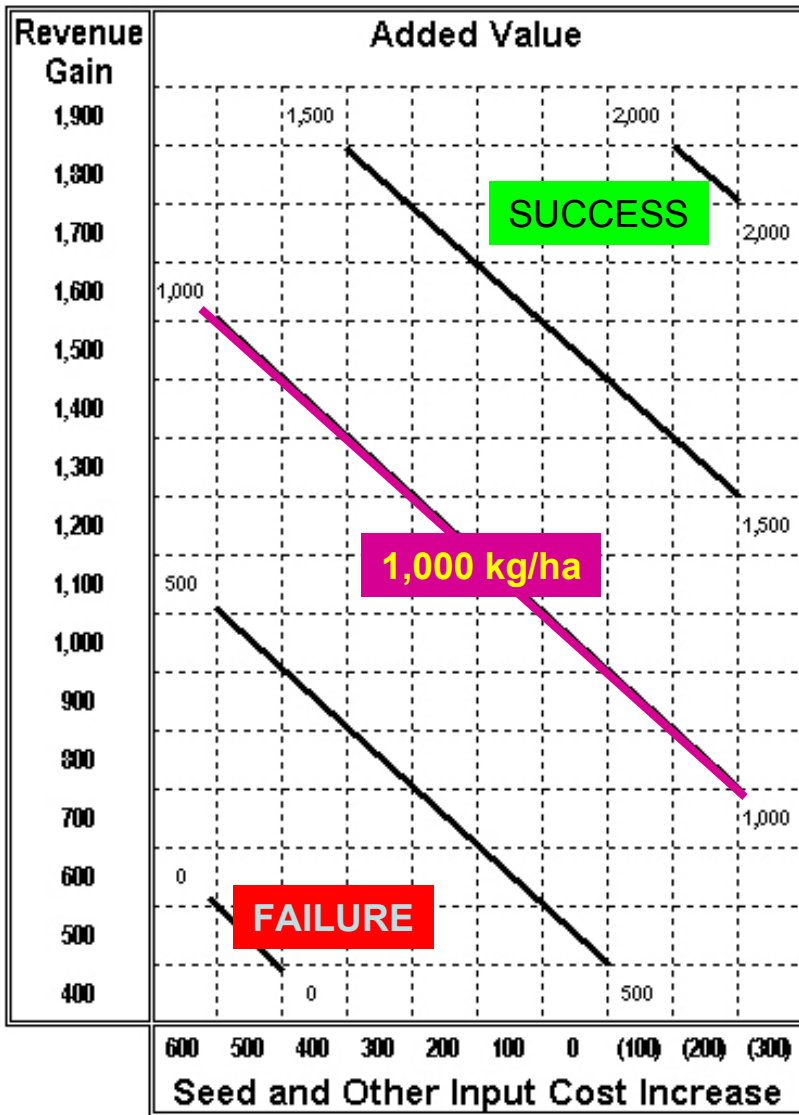
ADDED VALUE COMPONENT CHART – kg per ha

Y-axis is Revenue Gain

   Yield and Grain Price Combined

X-axis is Grain Cost Change

   Seed and Input Costs Combined

Sloping Lines are Constant Added Value

Successful Hybrids are Top Right

Unsuccessful Hybrids are Bottom Left

In conclusion ………..

We have shown how the measurement of the Added Value of a new hybrid involves the quantification and summation of four areas of cost and benefits.

In a subsequent step we have shown how the Added Value is shared between the seed producer and farmer at different seed prices.

We have shown how product viability can be assessed and a decision made as to whether the product should be launched and what a fair seed price would be.

The structure and ownership of the hybrid seed system varies from country to country but the basic principles involved in creating, measuring and sharing hybrid benefits are universal.

Acknowledgements and Thanks

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