



**THE ROLE OF IOPRI IN IMPROVING
PALM OIL PRODUCTION
THROUGHOUT INDONESIA VIA
WORK WITH SMALLHOLDER AND
STATE OWNED ENTERPRISES**



INDONESIAN OIL PALM RESEARCH INSTITUTE (IOPRI)
PUSAT PENELITIAN KELAPA SAWIT (PPKS)
Jl. Brigjen Katamso 51, Medan 20158, North Sumatra



OUTLINE

- INTRODUCTION
- IMPROVING PRODUCTIVITY
- THE ROLE OF IOPRI

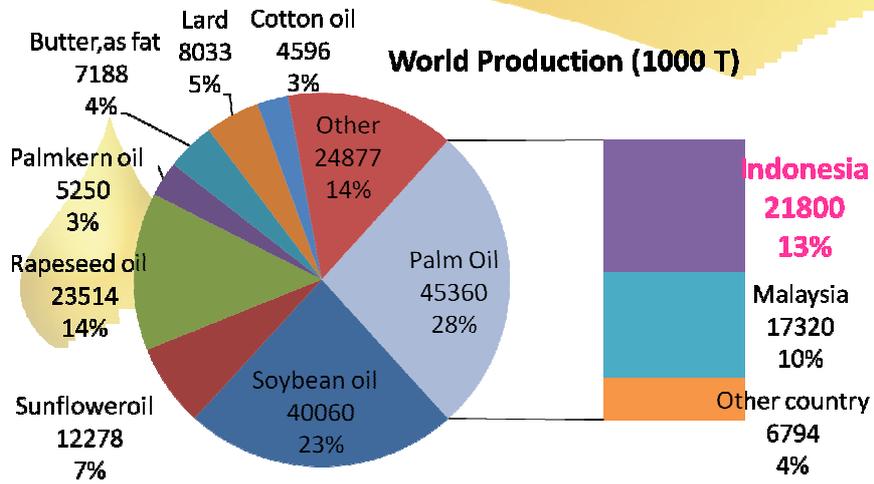


Oil palm history in Indonesia

1848	4 seeds introduced to Bogor as ornament
1858	146 seeds were spread out in Indonesia
1911	<i>336 ha oil palm planted in Sungei Liput estate</i>
1916	Algemeene Proefstation der AVROS founded
1922	First POM was built in Tanah Itam Ulu
1977	First oleochemical mill was built in Tangerang
1977	First NES scheme in South Sumatra and Aceh
1981	First export of PKO
1990	Oil palm area : 1 million ha
1995	Oil palm area : 2 million ha
2000	Oil palm area : 4.2 million ha
2010	Oil palm area : 7.8 million ha (now the biggest producing country)

- 
- The importance of oil palm in Indonesia
 - 1.5% of GDP (2010) & 60% of total estate crops' contribution
 - Provides job opportunities for about 5 million families (3.3 million at on-farm)
 - Proven agent of development in rural area
 - Has great multiplier effects
 - The future of oil palm industry
 - Great potential for development: expansion, intensification & product diversification

17 Oil and Fats Production 2010



Kg oil/ha/yr

3,500
3,000
2,500
2,000
1,500
1,000
500
-

Kedelai

Rapeseed

Palm

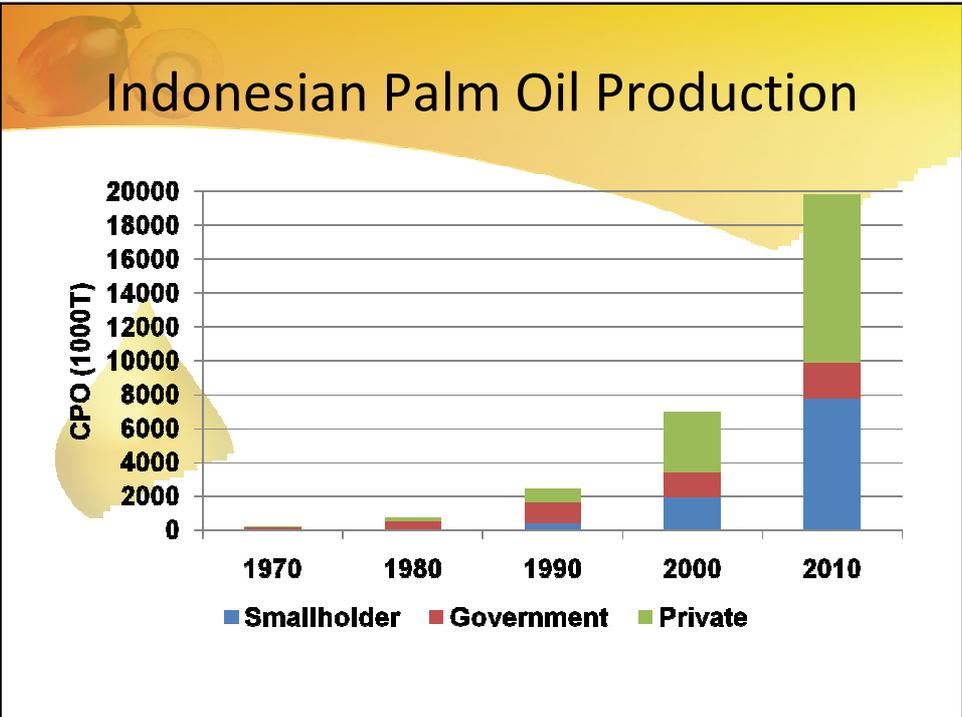
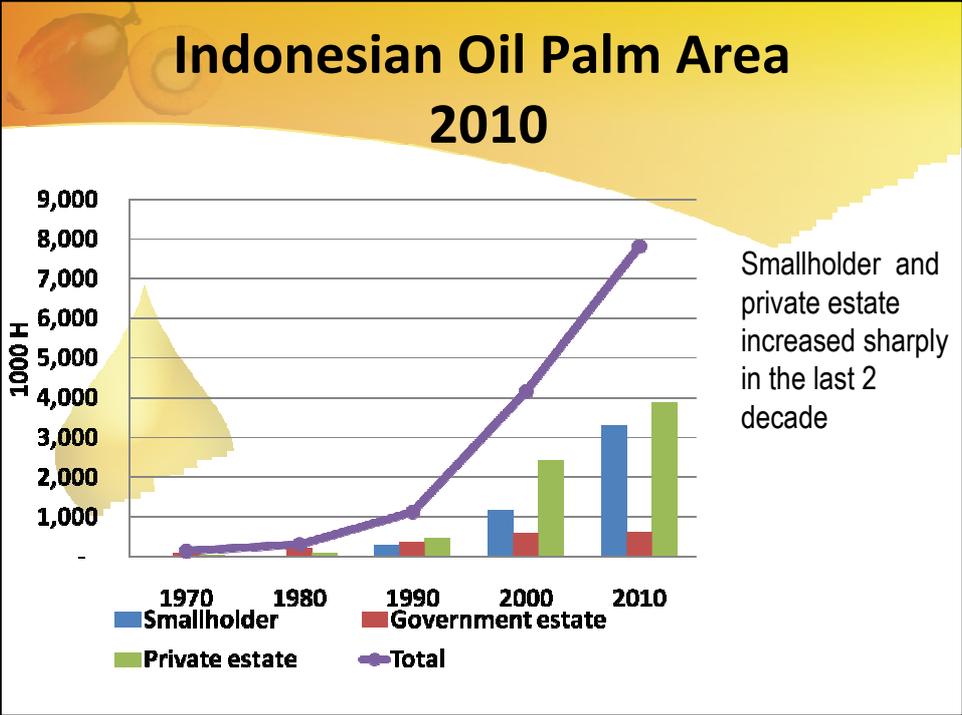
Sunflower

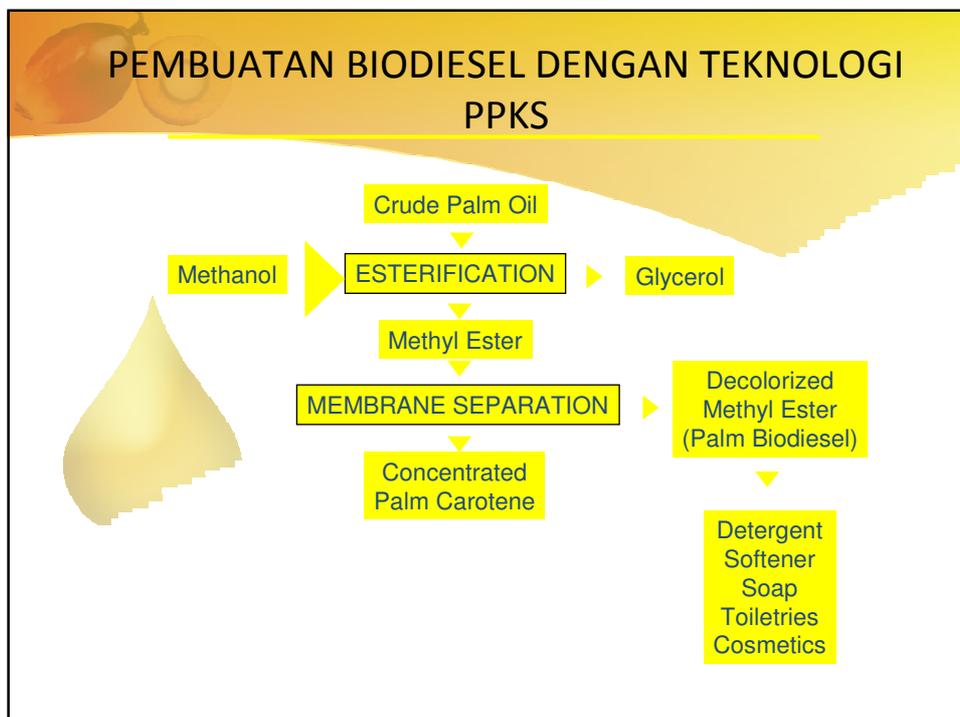
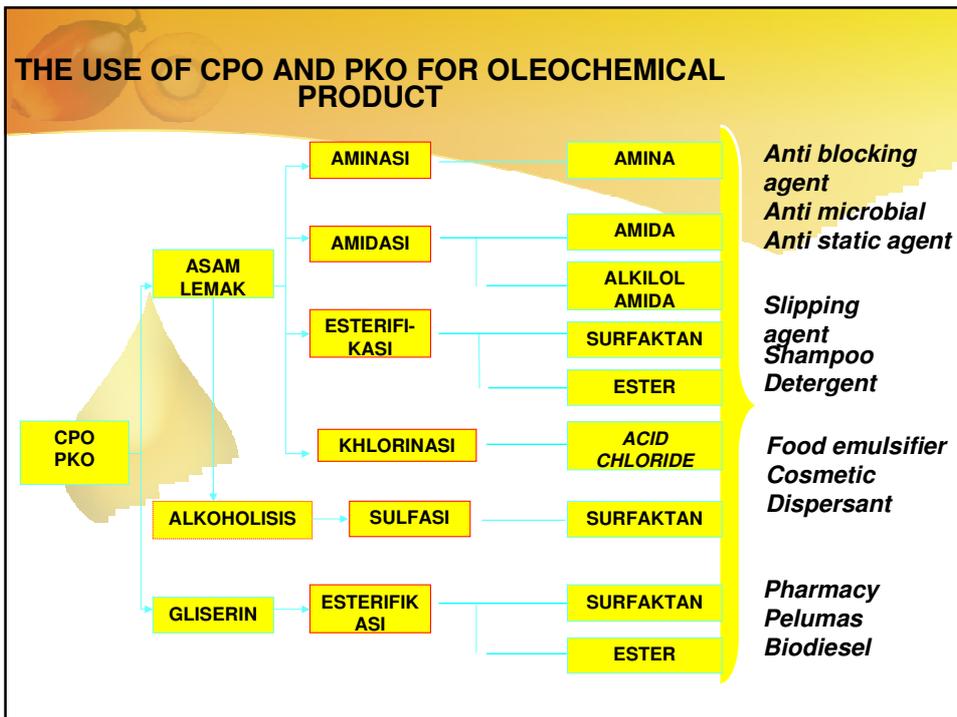
Cottonseed

Groundnut

Coconut

Oil palm is the most productive plant





BIODIESEL FROM PALM OIL



- a. Biodiesel CPO
- b. Biodiesel RBDPO
- c. Biodiesel of cooking oil waste
- d. Biodiesel PKO
- e. Biodiesel PFAD



PROSPECT

- Sources of alternative energy
- Product diversification
- Export opportunity



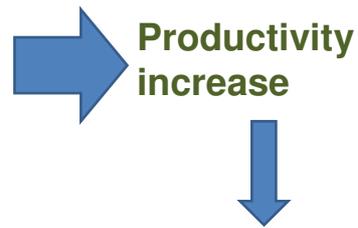
Current Productivity

Productivity of Palm Oil
(Ton/ha/year)

	Fact	Potency
Smallholder	3.4	GAP
Government	3.9	
Private	3.9	

HOW TO IMPROVE THE PRODUCTIVITY

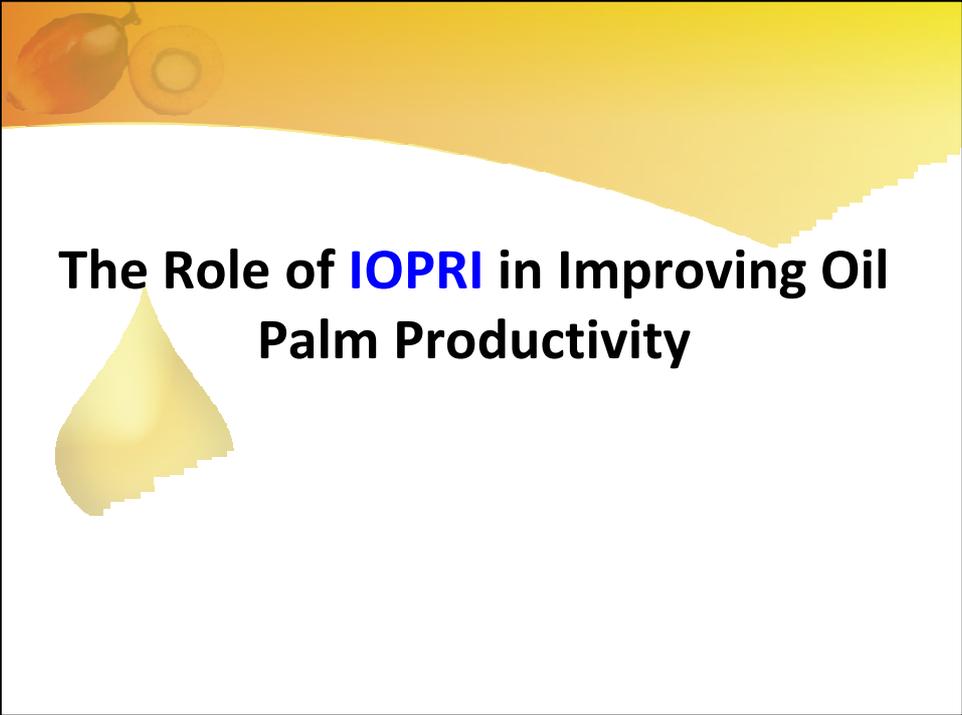
- **Breeding Program for New Planting Materials**
- **BMP (Best Management Practices)**
- **GMP (Good Manufacturing Practices)**
- **Production in sustainable way**



Target 2020 → 40 million ton of Palm Oil

CHALLENGES FOR PALM OIL INDUSTRY

- **Sustainability**
 - Palm vs Profitability (high price level- inputs for biodiesel?)
 - Palm vs People (workers, social, natives, security)
 - Palm vs Environment (Orangutans, Forest ,Biodiversity)
- **Global Warming (Environment)**
 - Palm vs Carbon Emission (CER)
 - Palm vs Peat Plantings
 - Palm Food vs Fuel
- **Palm vs Other Oilseeds**
 - Other Oilseeds Supply – not scrutinised ?
- **Food & Health Issues**
 - Saturated vs Trans Fat (demand & discount to soya)



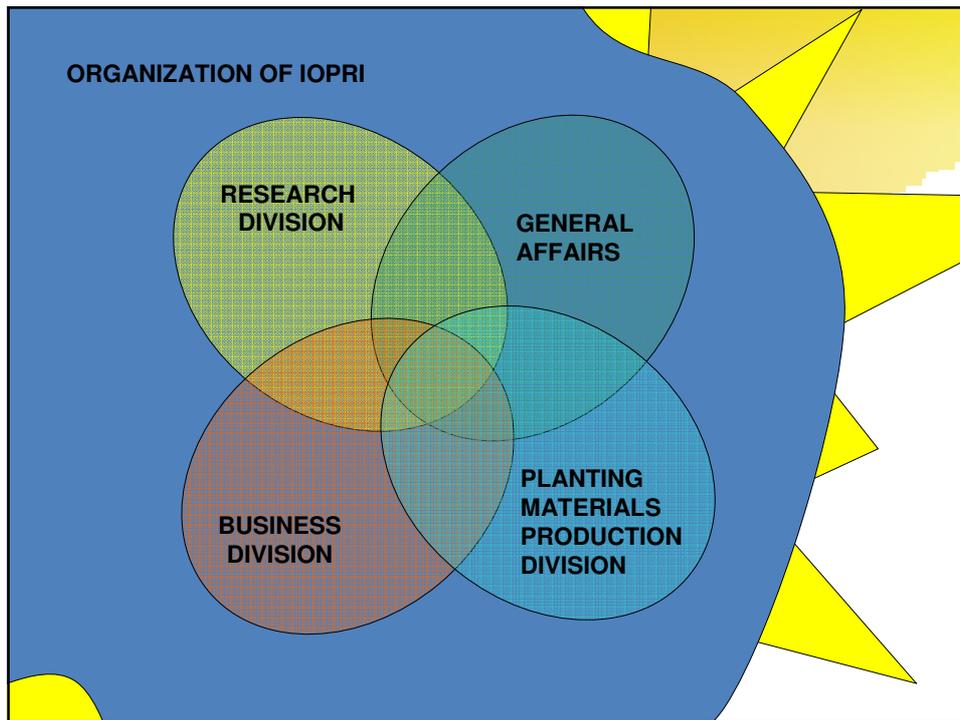
The Role of **IOPRI** in Improving Oil Palm Productivity



Indonesian Oil Palm Research Institute (IOPRI)

- IOPRI's history goes back to the colonial era, 1916 the establishment of AVROS
- Owned by Indonesian Government, **Self Funded**
- **Conduct research on all aspects of oil palm industry**
- **Provides knowledge based products and services: seeds, environmentally friendly control of pest and diseases, consultancies, trainings, analytical services**
- **IOPRI supports sustainable oil palm movement**
- **IOPRI is the R&D flagship in making Indonesia the world leader in oil palm industry**





IOPRI RESEARCH DIVISION

- 6 research groups
 - Plant Breeding & Plant Biotechnology
 - Soil & Agronomy
 - Plant Protection
 - Engineering & Environment
 - Product Development & Quality
 - Socio Techno Economy
- Supported by 60 researchers, 15 hold PhD

IOPRI BUSINESS AND SERVICES

- Oil Palm Planting Material and Clone
- Training, Seminar, Workshop and Conference
- Feasibility Study for Plantation and Mill
- Land Survey and Mapping
- Biological Agent for Pest and Disease
- Waste control
- By product technology
 - Compost from Empty Fruit Bunch (EFB)
 - Charcoal Briquet from Shell and EFB
 - Various of Oleo Food Product
 - Various of Oleo Chemical Product

12 varieties of IOPRI's Planting Material



- Ⓢ DxP Bah Jambi
- Ⓢ DxP Marihat
- Ⓢ DxP Rispa
- Ⓢ DxP La Me
- Ⓢ DxP Yangambi
- Ⓢ Dy x P Sungai Pancur 1
- Ⓢ DxP Sungai Pancur 2
- Ⓢ DxP Simalungun
- Ⓢ DxP Langkat
- Ⓢ DxP PPKS 540
- Ⓢ DxP PPKS 718
- Ⓢ DxP PPKS 239

New Release!

Productivity : 25 - 32 ton FFB/ha/year

OER : 24 – 27.4 %

Characteristic of IOPRI Planting Material



- Harvested : 24 - 28 month
- Rate of bunch: 12.9 bunch/tree/year (6-9/year)
- Rate of bunch weight : 19.2 kg/bunch (6-9/year)
- Productivity of FFB : 25 - 32 ton/ha/year
- OER : 24 – 27.4 %
- CPO production : 6.5 – 8.4 ton/ha/year

High yielding planting material, which were developed through a systematic and continuous oil palm breeding program, have increased the average potential of oil palm productivity from only 4.3 ton in 1960 to up to 8.4 ton CPO/ha/year in 2010.

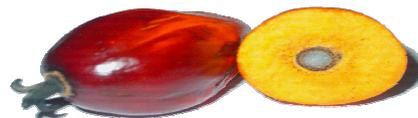
HIGH MESOCARP D x P PPKS 540

New Release

FFB : 28.1 ton/ha/year

OER : 27.4%

CPO : 8.1 ton/ha/year



BIG BUNCH D x P PPKS 718

New Release

FFB : 26.5 ton/ha/year

OER : 23.9%

CPO : 6.9 ton/ha/year



The Latest New Planting Material

DxP PPKS 239

High CPO, High PKO

SK Menteri Pertanian
No. 1883/Kpts/SR.120/5/2010
tanggal 5 Mei 2010

FFB : 32.6 ton/ha/year

OER : 25.8%

CPO : 8.4 ton/ha/year

PKO : 0.8 ton/ha/year

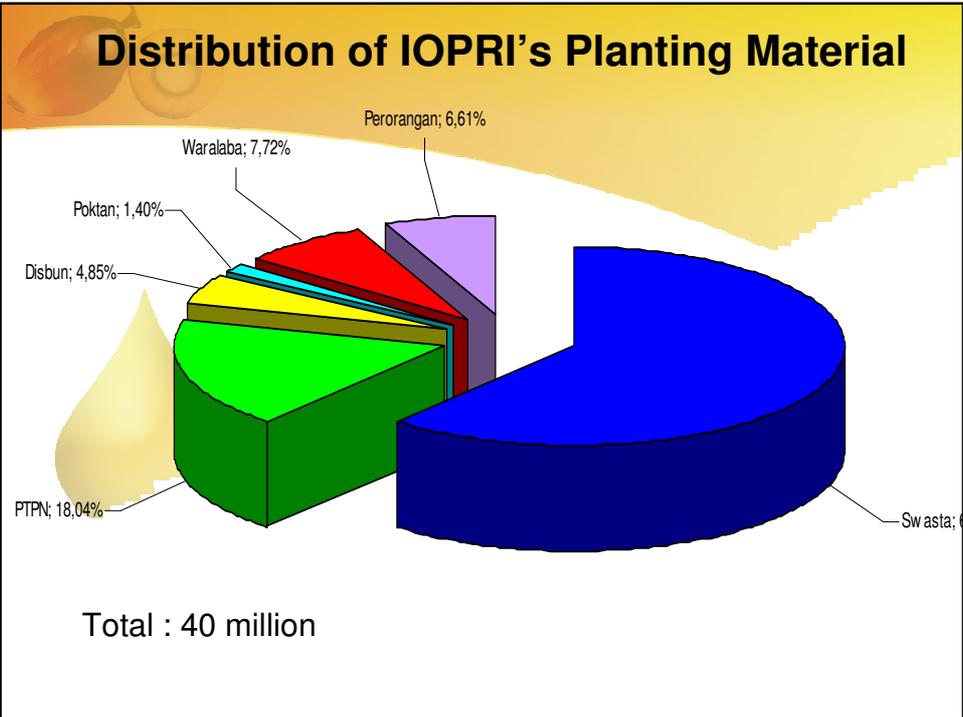
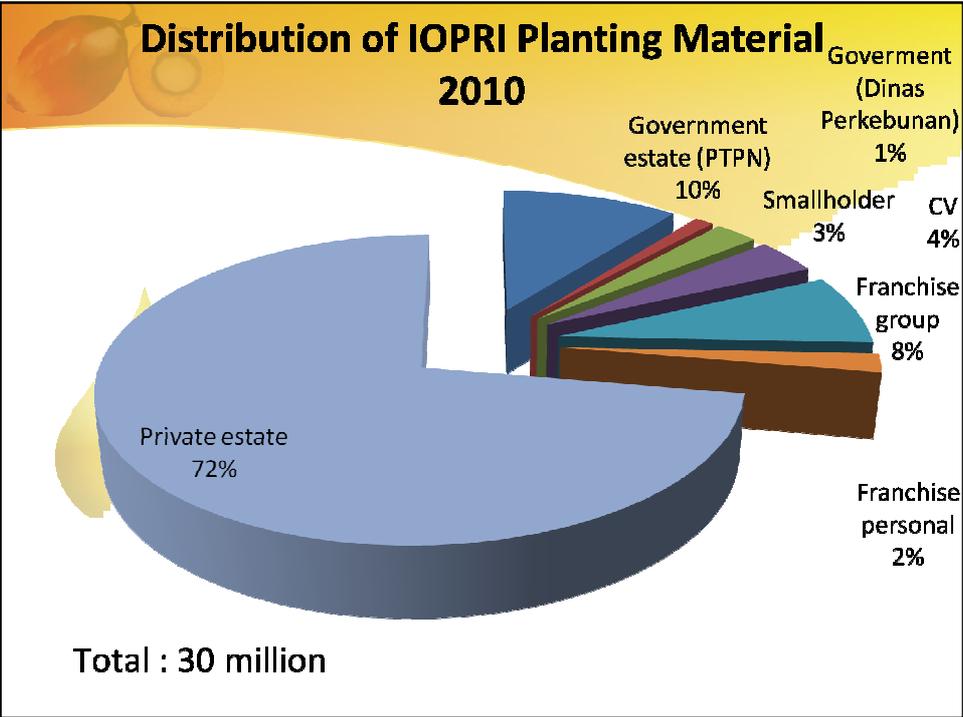




OIL PALM CLONE

- Elite Individual Palm
- Improving productivity → 20-30% higher than seedling
- Production capacity → 1 million clones





Franchise

No	Franchiser	Location	Total
1.	Disbun Tebo	Jambi	150.000
2.	CV Trubus	Kalsel	40.000
3.	Koperasi Agro Berseri	Kalsel	110.000
4.	PT Agricinal	Kaltim	1.500.000
		Bengkulu	500.000
5.	CV Ilham Maulana	Aceh	90.000
6.	PT Pertani	Riau	100.000
7.	PT Adian Ratu	Jambi	160.000
8.	Munir Marpaung	Sumbar	60.000
9.	Disbun Sumsel	Sumsel	180.000

Franchise of seed

No.	Penerima Waralaba	Lokasi	Jenis Waralaba	Jumlah/ Kapasitas	Keterangan
1.	PT Dutapalma Nusantara	Riau	Benih	2.000.000	Dalam Proses
			Varietas	10.000.000	MOU
2.	Balit Sembawa	Sumsel	Benih	3.000.000	MOU
			Varietas	10.000.000	MOU
3.	PT Agricinal	Bengkulu	Benih	3.000.000	MOU
			Varietas	5.000.000	MOU
		Kaltim	Benih	3.000.000	MOU
			Varietas	5.000.000	MOU
4.	PT Astra Agro Lestari	Sulsel	Benih	3.000.000	Dalam Proses
			Varietas	5.000.000	Dalam Proses
6.	PT Henrison	Papua	Varietas	5.000.000	Dalam Proses

Biaya dan Laba per Ha (2010)

Uraian	Benih Asli (Rp)	Benih Palsu (Rp)
Biaya Investasi tanaman	29.343.576	28.713.576
Biaya Pemeliharaan (4-5 th)	6.323.693	6.323.693
Biaya Pemeliharaan (6-8 th)	7.298.815	7.298.815
Biaya Pemeliharaan (9-16 th)	7.944.392	7.944.392
Biaya Pemeliharaan (17-25 th)	6.182.410	6.182.410
Biaya Produksi per kg TBS	605,54	913,98
Lababulan/ha	1.588.920	486.020

*) Harga TBS Rp. 1.400per kg

31

	Dura	Pisifera	Tenera
			
Benih Palsu	25 % Cangkang tebal Rendemen hanya 16%	25 % Tanpa cangkang Jarang berbuah (infertil)	50 % Produktivitas 50% Bukan hybrid vigor (F2)
Benih Asli	0%	0 %	99.9 % Hybrid vigor (F1) Produktivitas TBS >30 ton/ha Rendemen 26-29%

32

BMP at Air Batu field (PTPN) with IOPRI

Produksi Tanaman Kelapa Sawit TT.2006
di kebun Air Batu

Tahun	Luas (ha)	Produksi (ton)	Produktivitas (ton/ha)	Jumlah Tandan	RBT (kg)
2009	417	6,792	16.59	1,182,064	5.77
2010*	417	8,413	21.46	931,558	6.32

Keterangan : * data sampai dengan Oktober 2010



Oil Palm Technology and Information Center (Pustek Info)

1. East Kutai, East Kalimantan Province
2. North Bengkulu District, Bengkulu

Objective:

1. Experimental Garden
2. Dissemination of Knowledge, Technology and Information
3. Training and Education Center for farmer
4. Production of Oil Palm Planting Material

PROWITRA

Oil palm Smallholder Program

1. Dissemination of technology
2. Mobile information and service of planting material.
3. Design of re-planting for smallholder
4. Design of oil palm smallholder development

COOPERATION WITH PTPN

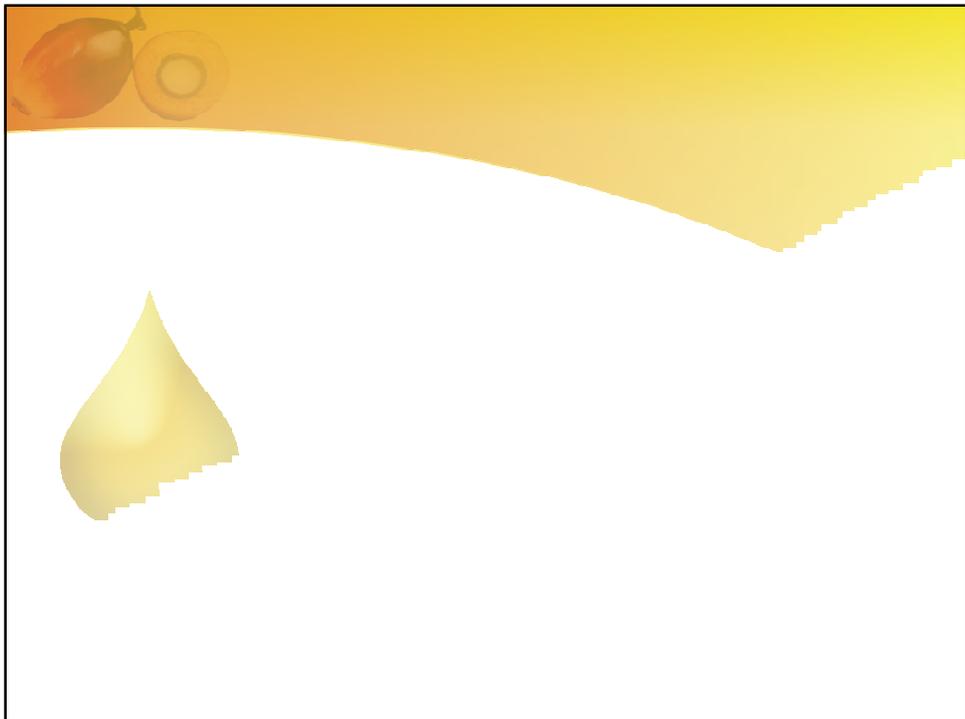
No.	Kegiatan	PTPN
1	Pengujian dan monitoring tanaman kelapa sawit hasil kultur jaringan di lapang	I, II, V, VI, VII, VIII, XIII
2	Pengujian keturunan untuk perakitan bahan tanaman kelapa sawit unggul	VII, XIII
3	Pengujian kelapa sawit pada areal endemik Ganoderma	I, II, VII
4	Memutus siklus hama <i>Oryctes rhinoceros</i> dengan teknik 'organic trapping'	V, VIII
5	Sistem pemeliharaan sarana dan prasarana jalan	V
6	Kajian teknoekonomi pabrik pengolahan inti sawit	V
7	Pemanfaatan bahan organik limbah kelapa sawit sebagai bahan pembenah tanah dan sumber hara di perkebunan kelapa sawit	VI



CONCLUSION

- IOPRI is proven body as a development agent for Indonesian Oil Palm Industry
- Improving productivity :
 1. Superior planting material through breeding
 2. Planting material for smallholder → franchise
 3. Best Management Practices application
 4. Development of Zero waste technology





TEKNOLOGI BUDIDAYA (KULTUR TEKNIS)

- Pemilihan lahan yang sesuai
- Pembukaan lahan tanpa bakar
- Penggunaan bahan tanaman unggul
- Klon kelapa sawit unggul
- *Zero waste* teknologi
- Pengembangan *Mucuna bracteata*
- Penelitian *eco-physiology*
- Pengendalian hama terpadu



TEKNIK PEMBUKAAN LAHAN TANPA BAKAR



MENGOLAH SAWIT TANPA BUANGAN (TEKNOLOGI "ZERO WASTE")

LIMBAH CAIR
(360 M³/Hari)

TANDAN KOSONG SAWIT
(138 Ton/Hari)



KOMPOS TKS

PAKAN TERNAK BERBASIS LIMBAH SAWIT

Jenis bahan baku	Formula 1
Pelepah sawit (%)	60
Lumpur sawit (%)	18
Bungkil inti sawit (%)	18
Dedak (%)	4
Urea (% dari jumlah pakan)	0.4
Garam (% dari jumlah pakan)	0.1
Kandungan energi (Kal/kg)	4760
Kandungan protein (%)	7.8

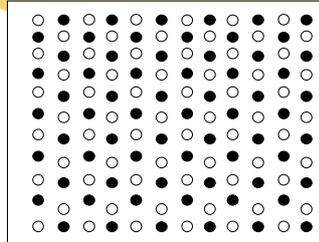
**Pertambahan bobot selama
12 minggu 38 kg**



TEKNIK UNDERPLANTING PADA PEREMAJAN KELAPA SAWIT



U
↑



Teknik *underplanting* menghilangkan masa kevakuman melalui hasil tanaman tua yaitu, berkisar antara 9 – 11 ton per ha per tahun.

Keterangan gambar

: tanaman tua yang akan diremajakan

: tanaman muda yang di-underplanting

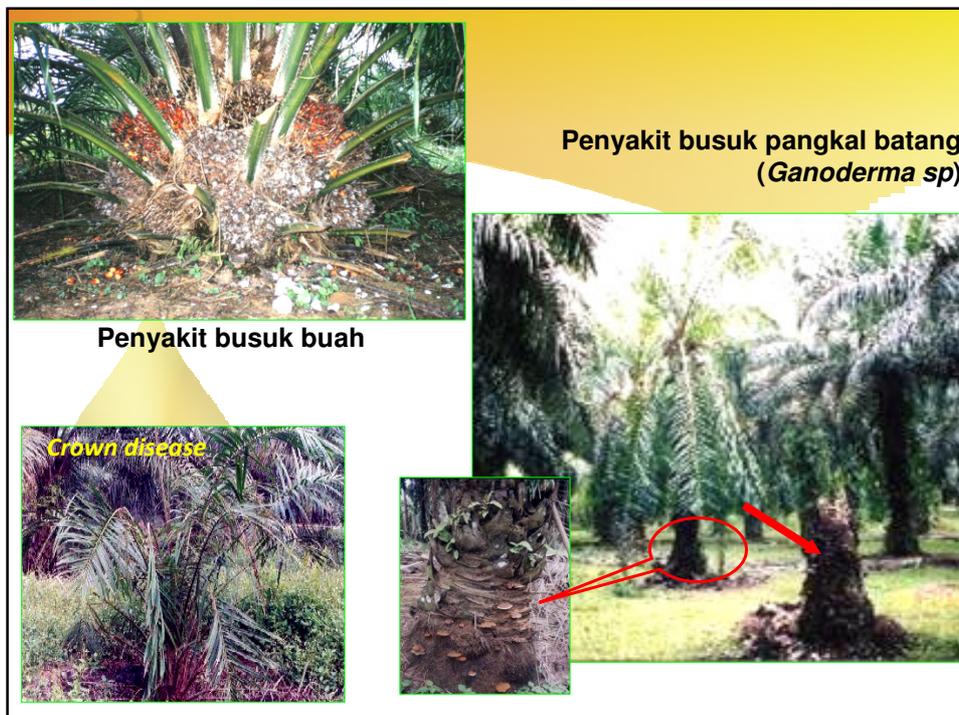
Ditujukan pada areal yang tidak rawan *Ganoderma* dan *Oryctes rhinoceros*

PENGENDALIAN KUMBANG TANDUK (*Oryctes rhinoceros*) DENGAN FEROMONAS

Satu ferotrap digunakan untuk areal seluas 1-2 ha selama 2 bulan.

Ferotrap digantungkan pada tiang bambu pada ketinggian 2,5 - 3,0 meter.





KOMPOS DARI TANDAN KOSONG SAWIT



PENCACAHAN



**PEMBUATAN
TUMPUKAN**



PEMBALIKAN



KOMPOS TKS



PENGERINGAN



**PENYIRAMAN DENGAN
LIMBAH CAIR**

PENGENDALIAN BUSUK PANGKAL BATANG PADA TANAMAN KELAPA SAWIT



Biofungisida Marfu-P

500 g biofungisida
Marfu-P dan
ditimbun dengan
tanah



*paket teknologi
penghindaran serangan
Ganoderma dengan
pemanfaatan lubang tanam
besar dan agensia hayati
Trichoderma sp.*



200 g biofungisida
Marfu-P dan ditabur
di piringan pohon

COOPERATION WITH PTPN

No.	Kegiatan	PTPN
1	Pengujian dan monitoring tanaman kelapa sawit hasil kultur jaringan di lapang	I, II, V, VI, VII, VIII, XIII
2	Pengujian keturunan untuk perakitan bahan tanaman kelapa sawit unggul	VII, XIII
3	Pengujian kelapa sawit pada areal endemik Ganoderma	I, II, VII
4	Memutus siklus hama <i>Oryctes rhinoceros</i> dengan teknik 'organic trapping'	V, VIII
5	Sistem pemeliharaan sarana dan prasarana jalan	V
6	Kajian teknoekonomi pabrik pengolahan inti sawit	V
7	Pemanfaatan bahan organik limbah kelapa sawit sebagai bahan pembenah tanah dan sumber hara di perkebunan kelapa sawit	VI

Some of IOPRI's products and technologies



Some of IOPRI's services



PEMILIHAN LAHAN YG SESUAI

- ✓ PEMBARUAN SISTEM KLASIFIKASI KESESUAIAN LAHAN GAMBUT UNTUK KELAPA SAWIT
- ✓ KONSERVASI TANAH/AIR PADA DAERAH BERIKLIM KERING PANJANG

