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Sustainability Matters for Legume Protein Crops in NW-Europe

Benjamin Laga

28/03/2022 - Crop Innovation & Business Conference

EU Protein Deficit

>70%

Of EU protein is imported

95%

Of EU soybean is imported

34Mt

Of soybean is imported in EU annually

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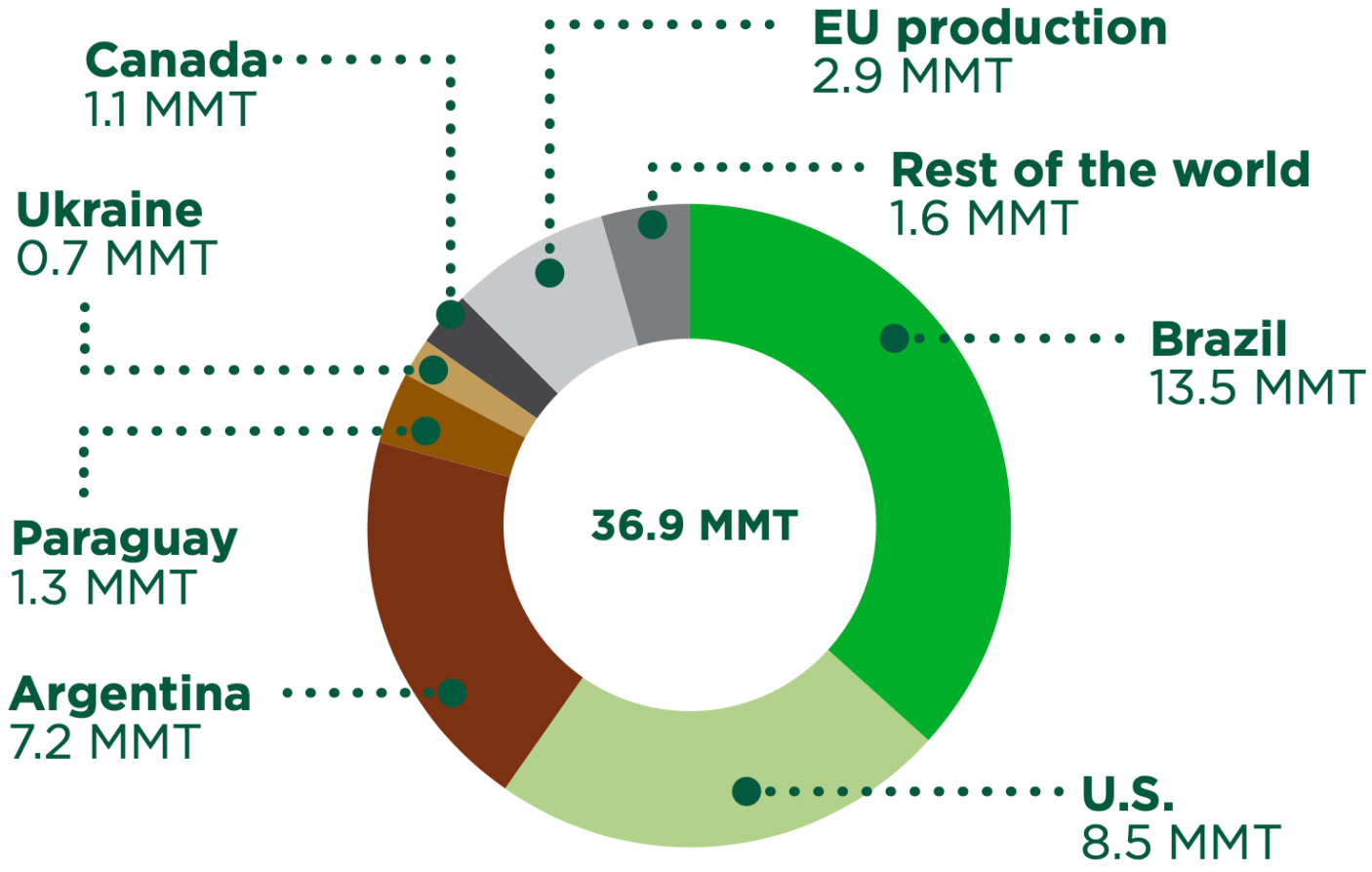
Over 50% of imported Plant Proteins originate from S-America



Source: IDH Eu soy monitor

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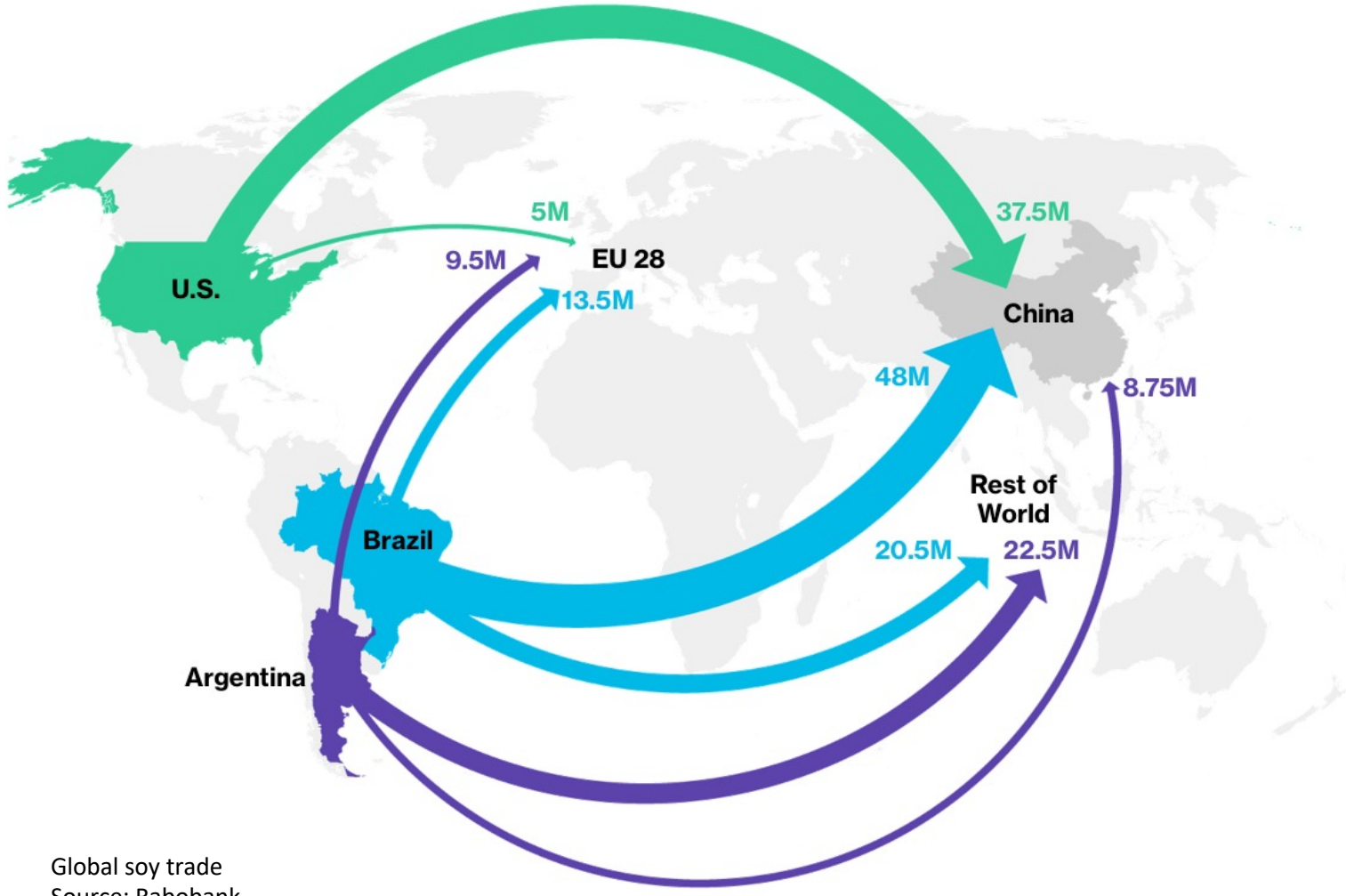
Major Global Trade Streams in Soybean



Global soy trade
Source: Rabobank

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The Impact on S-Am Ecosystems

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The Soy (meal) Use Case for EU?

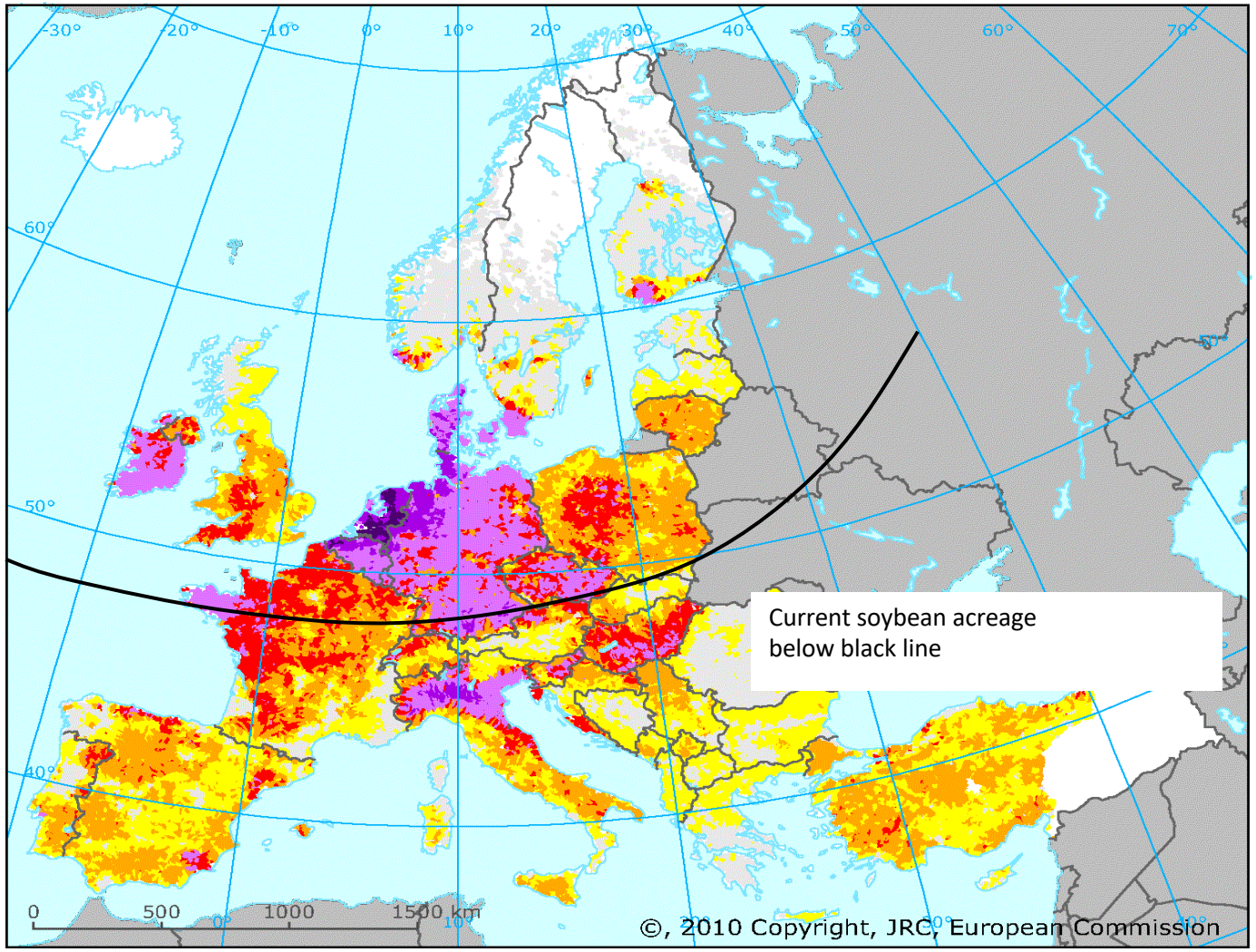
93%

Feed

7%

Food

Importing Protein = Importing Nitrogen



Nitrogen surplus, 2005

(kg/ha)

- < 10
- 10–20
- 20–30
- 30–40
- 40–80
- 80–150
- > 150
- No data
- Outside coverage

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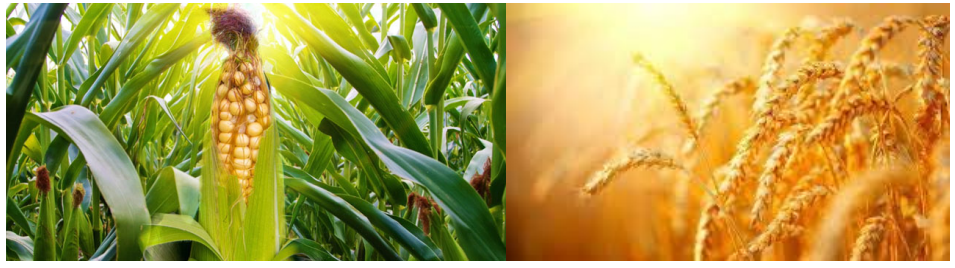
NW-EU mainly grows Wheat and Maize as feed



- Respond well to Nitrogen.

→250kg N/ha mineral fertilizer!

  - 1% of world energy for N-fertilizer
  - 30-50% energy efficiency
  - Nitrous oxide as by product: 265x more potent GH gas than CO2
  - Price linked to natural Gas price
  - EU net imports mineral N: from Russia…

- Relatively high pesticide use requirement (fungicides)
- Depletes to neutral for soil carbon

- Fix own nitrogen from ambient air

→ Make nitrogen also available for follow-up crop

  - Same wheat yield with 70% less nitrogen if grown after legumes
  - Require symbiosis with soil bacteria

- Soy relatively low pesticide use
- Stores soil carbon (regenerative)

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Summary: the Cartoonesque Globalized Protein Chain

Destroy rain forest to produce proteins

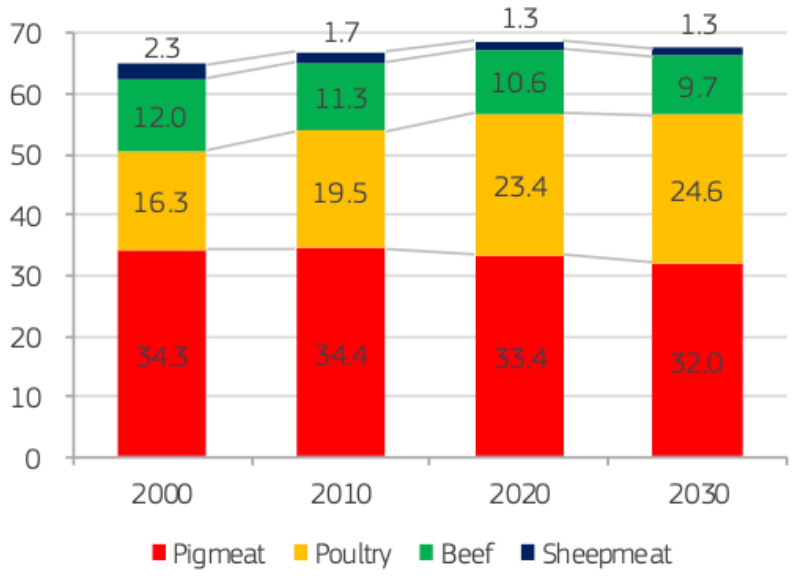
Double carbon footprint through shipping

Create nitrogen issue in NW-EU

Export unhealthy diet to developing middleclass in China

A protein and crop shift is urgently required!

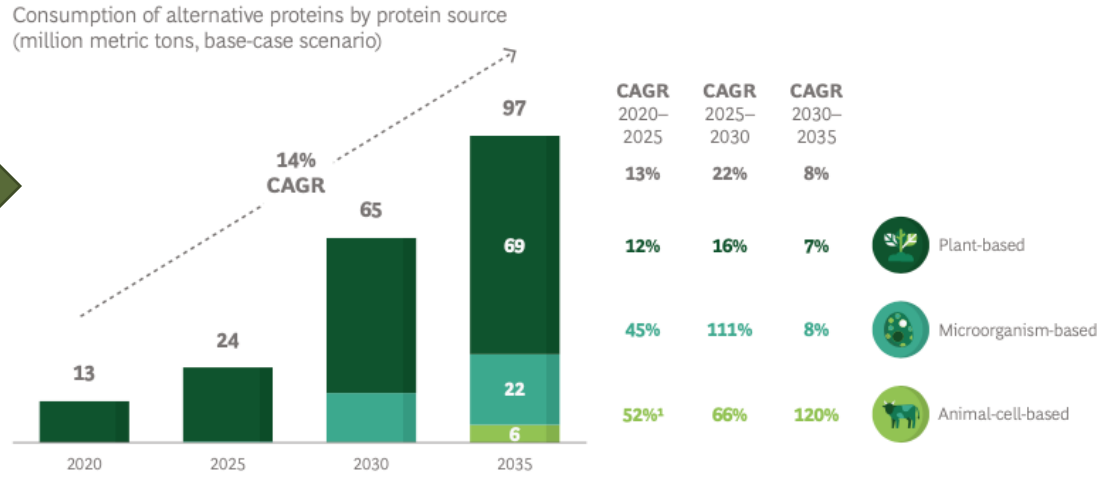
EU Meat consumptions stagnates, Meat and Dairy alternatives grow



Meat concumption per capita in EU over time
Source: EU Ag Outlook

About 30% of production is exported, mainly to China

14% CAGR



Source: BCG

Driven by environment, health and animal welfare conscious consumers

The Protein Shift

Meat and Dairy

93% 

- Cheap imported GM soy
  - High carbon footprint
  - Nitrogen Accumulation
  - Low conversion efficiency, higher acreage

Meat and Dairy Alternatives

7% 

- Premium local non-GM soy
  - Low carbon footprint
  - Soil regeneration (Nitrogen and Carbon)
  - High conversion efficiency, less acreage

Consumer Driven and Policy Supported Shift

First 2 soybean varieties registered in BE: Artemis and Hermes

Official registration Trials in Belgium demonstrate already up to 15% more protein per hectare

Rasnaam	Jaar van eerste inschrijving	Land van eerste inschrijving	Vertegenwoordiger	Aantal jaar in proef	Vroegheid (1-9; waarbij 1 = zeer vroeg) [2]	Relatieve opbrengst sojabonen [3]	Eiwitgehalte (%)	Relatieve eiwitopbrengst [3]	Lengte plant (cm)	Hoogte inplanting onderste peul (cm)	Bloeidatum	Legervastheid (1-9; waarbij 1 = zeer legergevoelig) [2]
Abaca	2019	AT	Saatzucht Donau	2	2	105,5	39,4	103,5	78	14	5/jul	8
Acardia	2018	AT	Saaten Union	3	3	107,1	37,2	99,3	81	14	7/jul	7
Achillea	2019	AT	Saaten Union	2	5	99,5	38,8	96,1	75	13	6/jul	9
Adsoy	2012	NL	Saaten Union	9	2	85,5	40,0	85,1	80	12	4/jul	6
Alexa	2015 (T)	AT	Saatzucht Donau	5	2	101,3	40,2	101,4	75	13	5/jul	8
Alicia	2019	AT	Saatzucht Donau	2	5	97,1	38,7	93,6	82	13	8/jul	8
Alvesta	2019	AT	Saatzucht Donau	2	5	100,2	40,5	101,2	85	15	7/jul	9
Amarok	2014	DE	InterSaatzucht	6	3	109,7	40,5	110,7	93	14	4/jul	7
Amiata	2019	AT	Saatzucht Donau	2	3	97,0	40,2	97,0	84	14	5/jul	8
Artemis	**2021**	**BE**	**Protealis**	**3**	**3**	**111,5**	**41,4**	**115,1**	**82**	**14**	**4/jul**	**8**
Aurelina	2018	AT	Saatzucht Donau	3	3	98,1	41,8	102,1	82	13	6/jul	8
Bettina	2016	AT	Saatzucht Donau	2	5	102,6	38,6	98,6	83	13	9/jul	9
ES Comandor	2016	FR	Euralis Semences	3	3	96,3	40,5	97,0	85	14	8/jul	8
Gallec	2000	CH	Delley Samen und Pflanzen	10	2	102,1	39,8	101,2	85	15	4/jul	6
GL Melanie	2016	AT	Saatzucht Gleisdorf	6	3	105,2	39,3	103,0	82	13	8/jul	8
Hermes	**2021**	**BE**	**Protealis**	**3**	**3**	**111,1**	**39,6**	**109,4**	**84**	**14**	**4/jul**	**8**
Lenka	2015	AT	Prograin	5	5	95,8	42,6	101,7	87	13	7/jul	8
Marquise	2017	AT	Delley Samen und Pflanzen	4	4	94,2	41,0	96,1	83	14	6/jul	6
Primus	2005	DE	Prograin	8	4	96,0	42,9	102,5	87	14	7/jul	8
Regina	2016	DE	Saatzucht Donau	3	3	99,8	41,0	101,8	80	14	6/jul	9
RGT Shouna	2014	FR	RAGT	5	4	103,2	41,2	105,8	83	13	5/jul	7
RGT Sphinxa	2019	FR	RAGT	2	4	99,5	41,5	103,0	75	13	7/jul	9
Sculptor	2017	PL	Saaten Union	3	2	86,8	39,0	84,3	83	14	9/jul	7
Sultana	2009	FR	RAGT	7	3	98,1	40,7	99,6	73	11	6/jul	9
Tiguan	2014	AT	Delley Samen und Pflanzen	3	1	84,4	39,2	82,4	84	17	2/jul	8
Viola	2015	AT	Saatzucht Donau	6	3	108,1	40,3	108,5	86	13	6/jul	7
Xena	2018	CH	Delley Samen und Pflanzen	2	3	104,4	38,3	99,6	91	15	3/jul	8
Gemiddelde [4]						100	40,1%	100,0	82,5 cm	13,6 cm		
100 =						3,8 ton sojabonen /ha (bij 15% vocht)		1509 kg eiwit/ha				

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Thank You!


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