

## Obective 2

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### Load packages

```
##          used (Mb) gc trigger (Mb) limit (Mb) max used (Mb)
## Ncells 478045 25.6   1032447 55.2          NA   666791 35.7
## Vcells 895425  6.9    8388608 64.0          16384  1824312 14.0
## [1] "Packages loaded successfully!"
```

### Load data

```
results_df <- read.csv("../RData/PartA_and_B_results.csv")

results_df <- results_df %>%
  mutate(GrowthStage = Week) %>%
  droplevels()
results_df$GrowthStage <- as.factor(as.character(results_df$GrowthStage))

results_df$GrowthStage <- recode_factor(results_df$GrowthStage, "23" = "V1", "24" = "V2", "25" = "V3",
```

### Grain plot

```
si_df <- results_df %>%
  filter(Unit == "SI" & VI == "NDVI" & Week >= 27) %>%
  droplevels()

grain_df <- si_df %>%
  filter(Fieldname == "DMD_GH1" | Fieldname == "SLS_ABH" | Fieldname == "SLS_NS") %>%
  droplevels()

grain_df$Fieldname <- factor(grain_df$Fieldname, levels = c("SLS_ABH", "SLS_NS", "DMD_GH1"))

grain_df$Fieldname <- recode_factor(grain_df$Fieldname, SLS_ABH = "Grain A1",
                                   SLS_NS = "Grain A2",
                                   DMD_GH1 = "Grain B1")

# grain_df$GrowthStage <- as.numeric(grain_df$GrowthStage)

# Define the number of colors you want
```

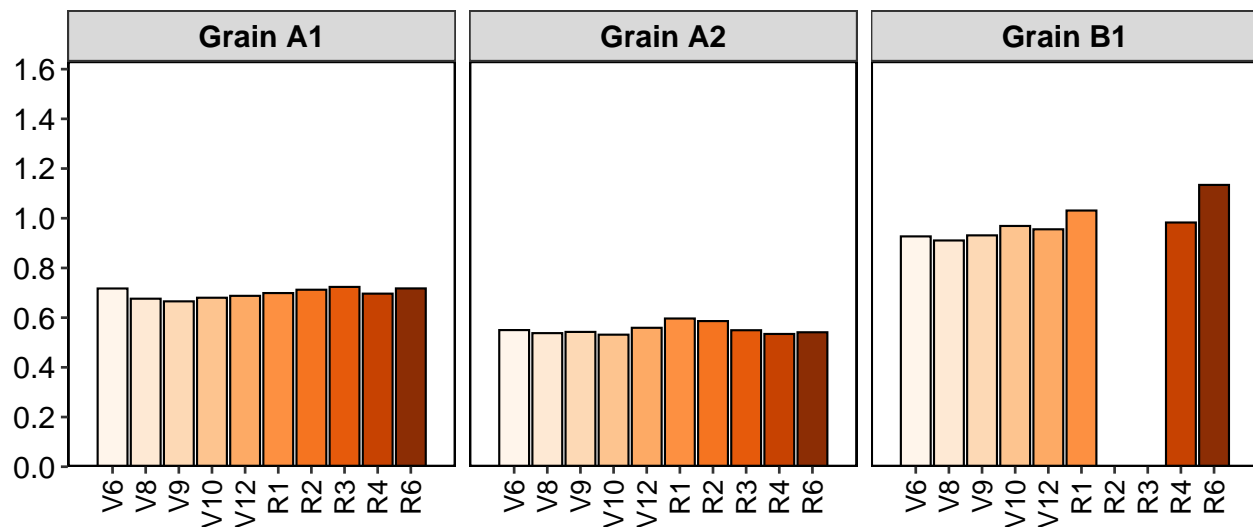
```

nb.cols <- length(unique(grain_df$GrowthStage))
mycolors <- colorRampPalette(brewer.pal(8, "Oranges"))(nb.cols)
# Create a ggplot with 18 colors

grain_plt <- ggplot(grain_df, aes(x = factor(GrowthStage), y = as.numeric(RMSE), fill = factor(GrowthS
  geom_bar(stat='identity', color = "black", size = 0.4, width = 0.9, position = position_dodge(0.4)) +
  facet_wrap(~Fieldname) +
  theme_bw() +
  # xlab("Vegetation indices") +
  # ylab("Root mean square error (RMSE, Mg/ha)") +
  scale_fill_manual(values = mycolors) +
  # scale_fill_manual(values = c("#E10000", "#FFB383", "#585959", "#C0C0C0", "#00A210", "#9BE186", "#8F
    scale_y_continuous(limit = c(0.0, 1.6), breaks = seq(0.0, 1.6, 0.2), expand = expansion(mult = c(0,
  scale_x_discrete(expand = expansion(mult = c(0.15, 0.15))) +
  theme(legend.position = "none") +
  # labs(fill = "Vegetation indices") +
  theme(axis.text.x = element_text(size = 11, color = "black", angle = 90, vjust = 0.5, hjust = 1),
        axis.text.y = element_text(size = 12, color = "black"),
        axis.title = element_blank(),
        panel.grid = element_blank(),
        strip.text = element_text(size = 12, color = "black", face = "bold"),
        legend.text = element_text(size = 12, color = "black"),
        legend.title = element_text(size = 12, face = "bold"),
        panel.border = element_rect(colour = "black", fill=NA, size=0.75))

```

grain\_plt



## Silage plot

```

si_df <- results_df %>%
  filter(Unit == "SI" & VI == "NDVI" & Week >= 27) %>%
  droplevels()

silage_df <- si_df %>%

```

```

filter(Fieldname != "DMD_GH1" & Fieldname != "SLS_ABH" & Fieldname != "SLS_NS") %>%
droplevels()

silage_df$Fieldname <- factor(silage_df$Fieldname, levels = c("PSF_111", "PSF_12", "SSF_121", "SSF_202"))

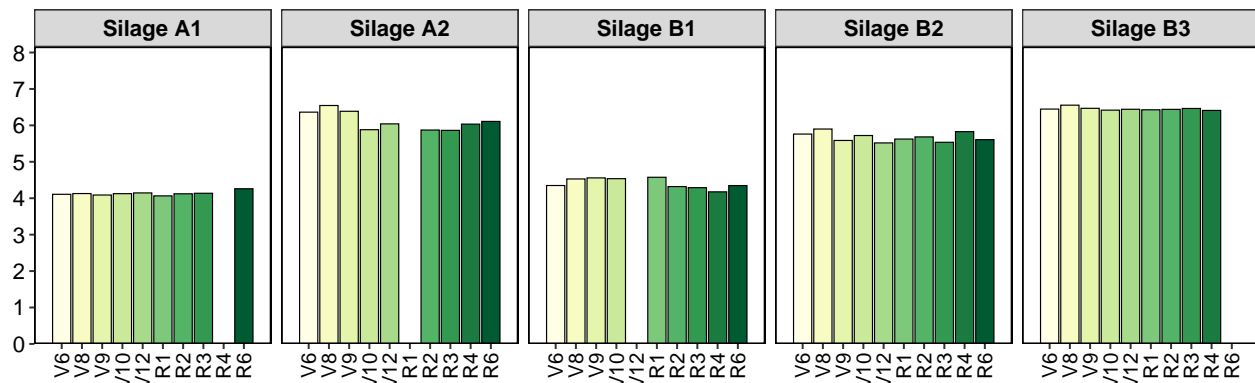
silage_df$Fieldname <- recode_factor(silage_df$Fieldname,
                                   PSF_111 = "Silage A1",
                                   PSF_12 = "Silage A2",
                                   SSF_121 = "Silage B1",
                                   SSF_202 = "Silage B2",
                                   SSF_66 = "Silage B3")

# Define the number of colors you want
nb.cols <- length(unique(silage_df$GrowthStage))
mycolors <- colorRampPalette(brewer.pal(8, "YlGn"))(nb.cols)
# Create a ggplot with 18 colors
# Use scale_fill_manual

silage_plt <- ggplot(silage_df, aes(x = factor(GrowthStage), y = as.numeric(RMSE), fill = factor(GrowthStage))) +
  geom_bar(stat='identity', color = "black", size = 0.3, width = 0.9, position = position_dodge(0.4)) +
  facet_wrap(~Fieldname, nrow = 1) +
  theme_bw() +
  # xlab("Vegetation indices") +
  ylab("Root mean square error (RMSE, Mg/ha)") +
  scale_fill_manual(values = mycolors) +
  # scale_fill_manual(values = c("#E10000", "#FFB383", "#585959", "#C0C0C0", "#00A210", "#9BE186", "#8FBC8F", "#4682B4")) +
  scale_y_continuous(limit = c(0.0, 8.0), breaks = seq(0.0, 8.0, 1.0), expand = expansion(mult = c(0, 0.1))) +
  scale_x_discrete(expand = expansion(mult = c(0.15, 0.15))) +
  theme(legend.position = "none") +
  # labs(fill = "Vegetation indices") +
  theme(axis.text.x = element_text(size = 11, color = "black", angle = 90, vjust = 0.5, hjust = 1),
        axis.text.y = element_text(size = 12, color = "black"),
        axis.title = element_blank(),
        panel.grid = element_blank(),
        strip.text = element_text(size = 12, color = "black", face = "bold"),
        legend.text = element_text(size = 12, color = "black"),
        legend.title = element_text(size = 12, face = "bold"),
        panel.border = element_rect(colour = "black", fill=NA, size=0.75))

silage_plt

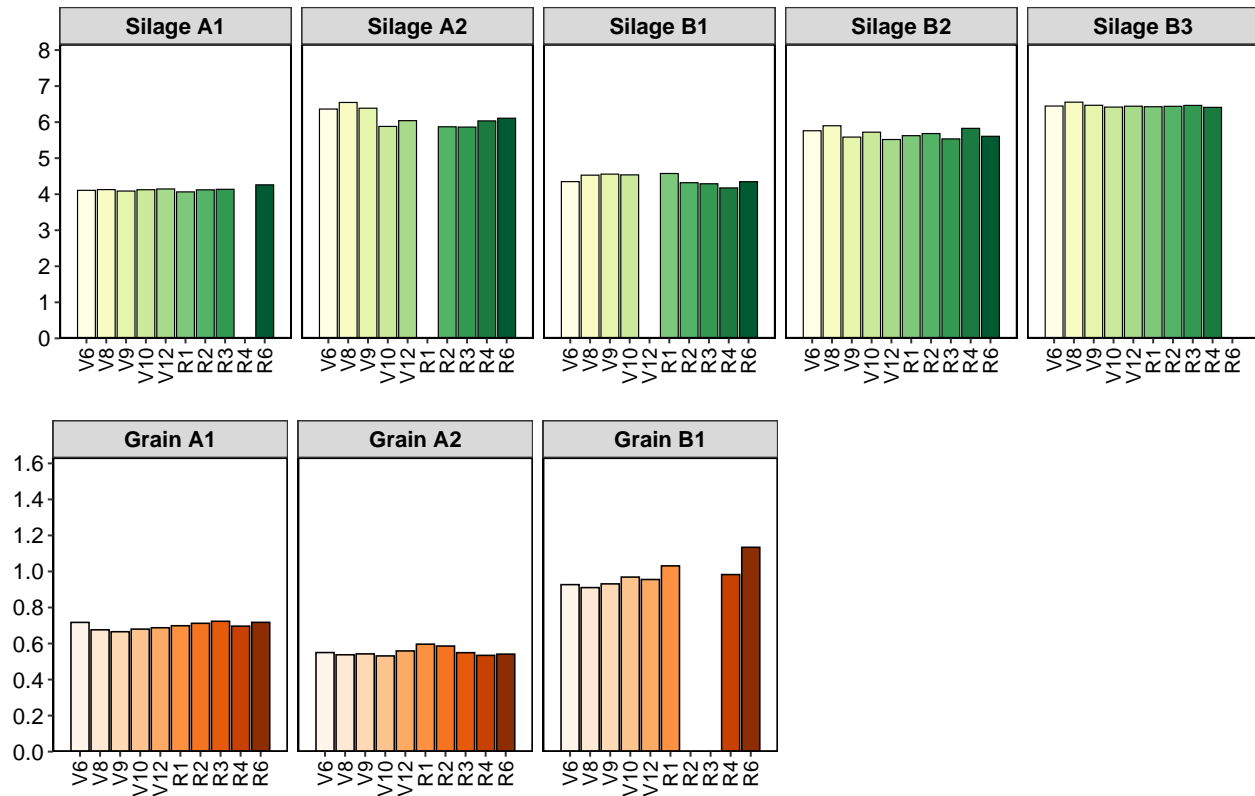
```



## Combine plots and save

```
# library(cowplot)
```

```
ggdraw() +  
  draw_plot(silage_plt, x = 0.02, y = 0.5, width = 0.98, height = .48) +  
  draw_plot(grain_plt, x = 0, y = 0, width = .62, height = .48)
```



```
# draw_plot(bp, x = 0, y = 0, width = 1, height = 0.5) +  
# draw_plot_label(label = c("A", "B", "C"), size = 15,  
#                 x = c(0, 0.5, 0), y = c(1, 1, 0.5))  
  
# ggsave("PartB_plot.png", width = 9.5, height = 6.2, unit = "in")  
#
```