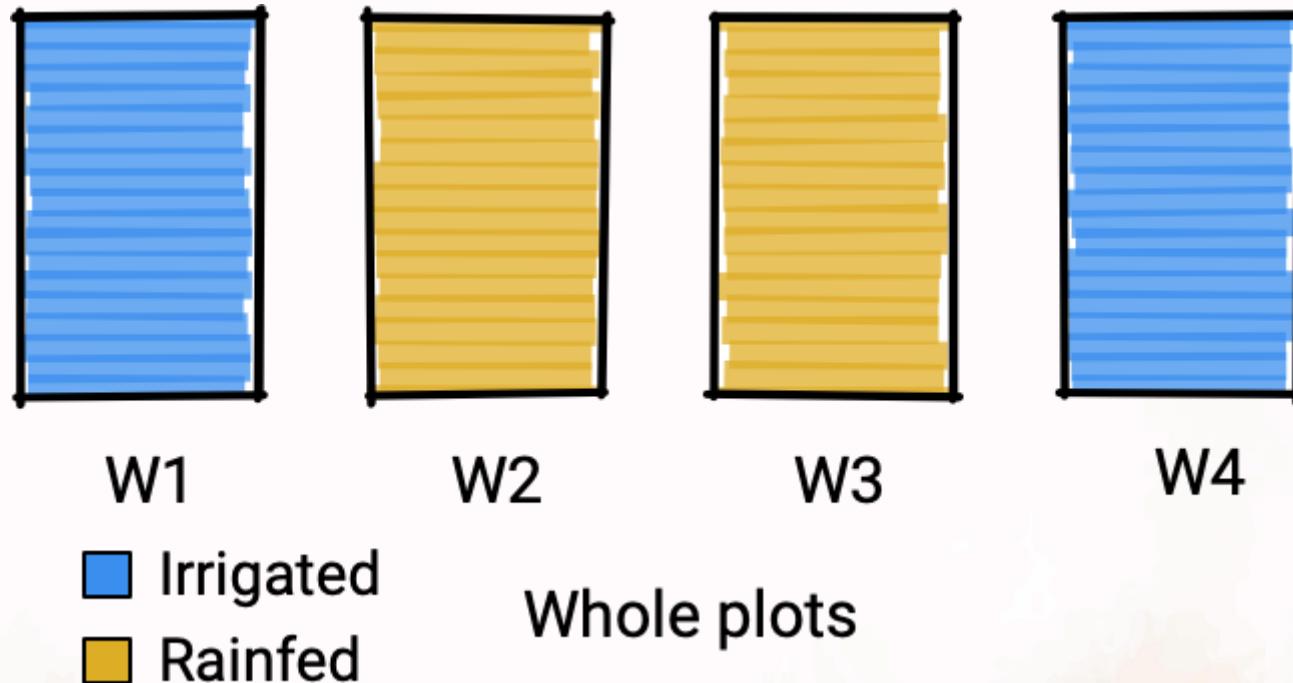


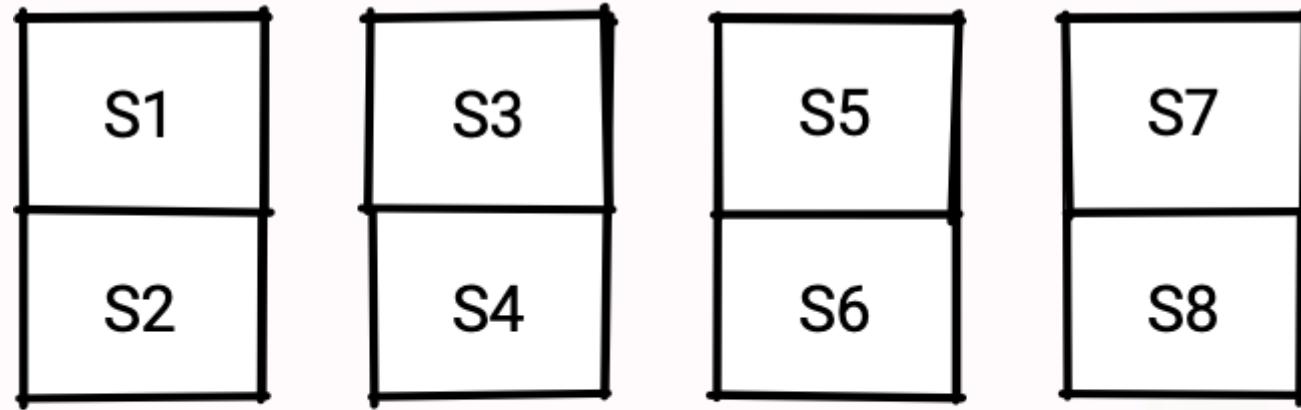
# *Classical split-plot design*

**Context:** Study of two irrigation methods and two fertilizer brands on yield of a crop.



# *Classical split-plot design*

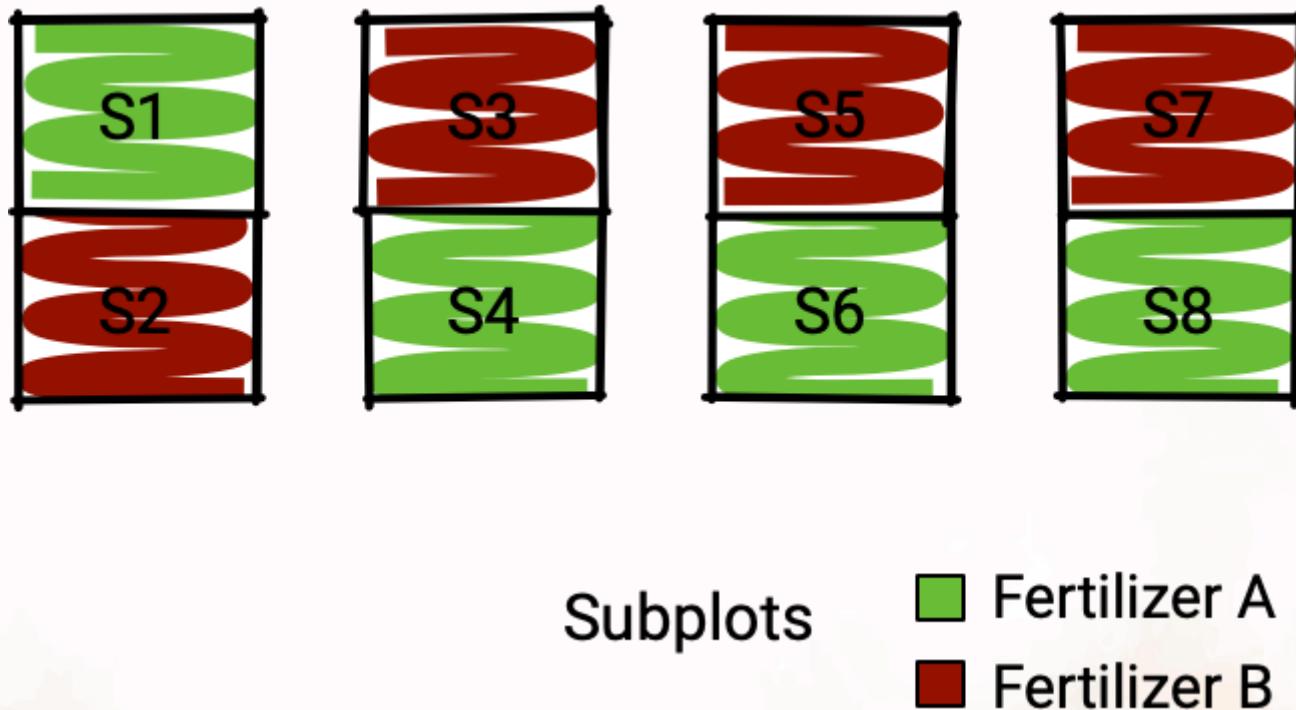
**Context:** Study of two irrigation methods and two fertilizer brands on yield of a crop.



Subplots

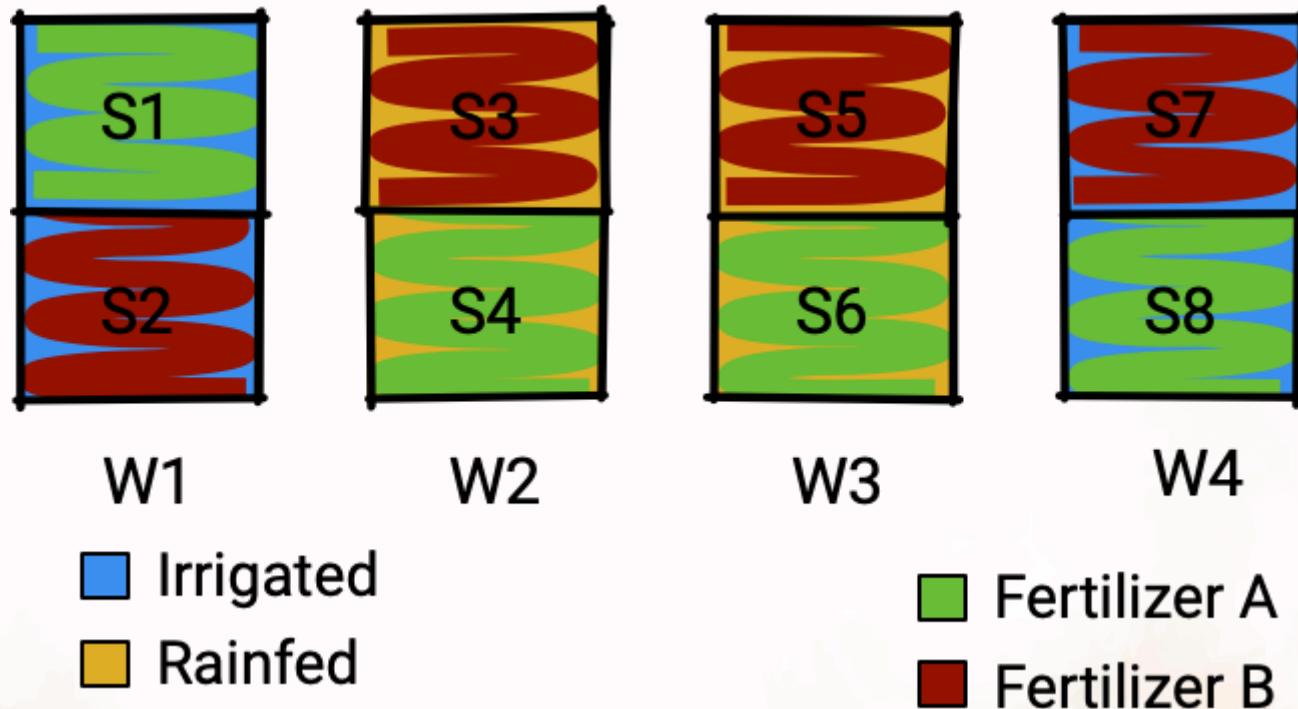
# *Classical split-plot design*

**Context:** Study of two irrigation methods and two fertilizer brands on yield of a crop.



# *Classical split-plot design*

**Context:** Study of two irrigation methods and two fertilizer brands on yield of a crop.



# How to *code* design of experiments?

From the grounds up:

```
set.seed(1)

# wholeplot
water <- c("irrigated", "rainfed")
data.frame(
  wholeplot = c("W1", "W2", "W3", "W4"),
  water = sample(rep(water, 2))
)

# subplot
brand <- c("A", "B")
data.frame(
  subplot = paste0("S", 1:8),
  fert = as.vector(replicate(4, sample(brand))))
)
```

subplot	fert		
		S1	A
wholeplot	water	S2	B
W1	irrigated	S3	A
W2	irrigated	S4	B
W3	rainfed	S5	B
W4	rainfed	S6	A
		S7	A
		S8	B

# The *cool kid* on the block: agricolae

```
library(agricolae)
design.split(trt1 = water,
            trt2 = brand,
            r = 2)$book
```

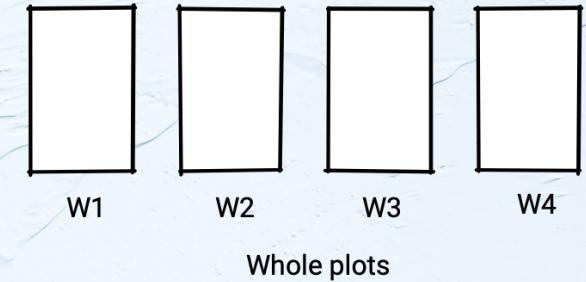
plots	splots	block	water	brand
101	1	1	irrigated	A
101	2	1	irrigated	B
102	1	1	rainfed	A
102	2	1	rainfed	B
103	1	2	rainfed	B
103	2	2	rainfed	A
104	1	2	irrigated	A
104	2	2	irrigated	B

# The *new kid* on the block: edibble

```
library(edibble)  
start_design("split-plot")
```

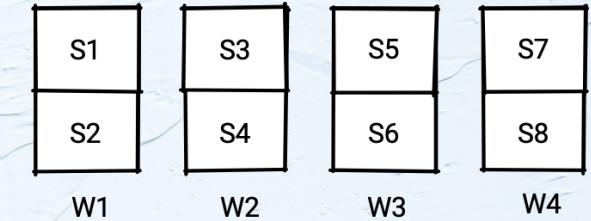
# The *new kid* on the block: edibble

```
library(edibble)  
start_design("split-plot") %>%  
  set_units(wholeplot = 4)
```



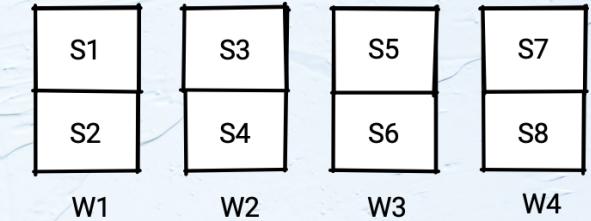
# The *new kid* on the block: edibble

```
library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4) %>%
  set_units(subplot = nested_in(wholeplot, 2))
```



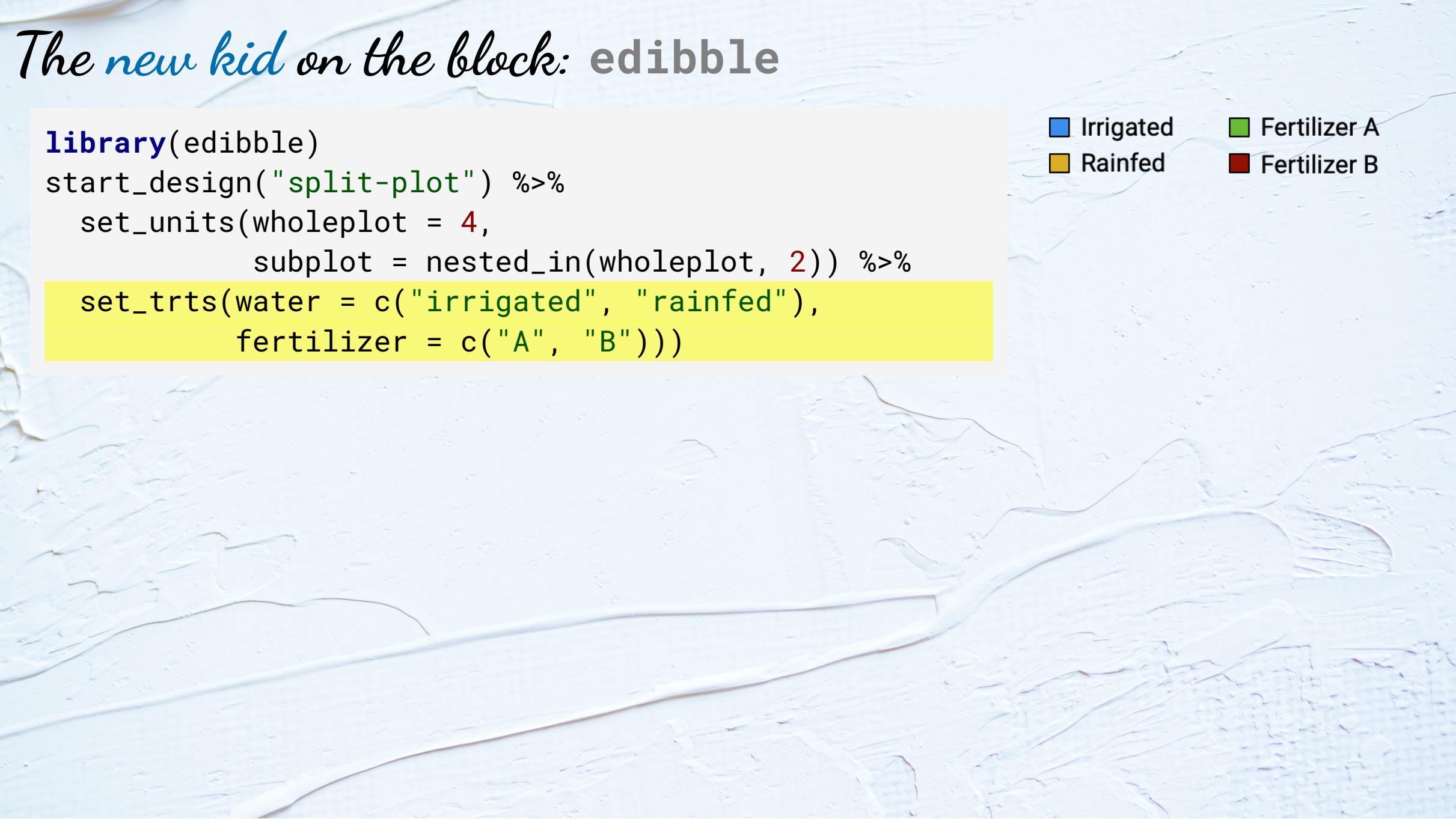
# The *new kid* on the block: edibble

```
library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4,
            subplot = nested_in(wholeplot, 2))
```



# The *new kid* on the block: edibble

```
library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4,
            subplot = nested_in(wholeplot, 2)) %>%
  set_trts(water = c("irrigated", "rainfed"),
           fertilizer = c("A", "B")))
```

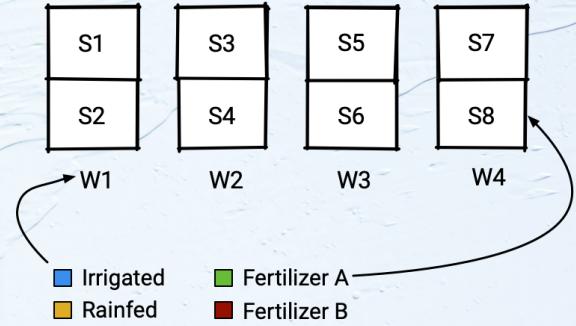


Legend:

- Irrigated (Blue square)
- Rainfed (Yellow square)
- Fertilizer A (Green square)
- Fertilizer B (Red square)

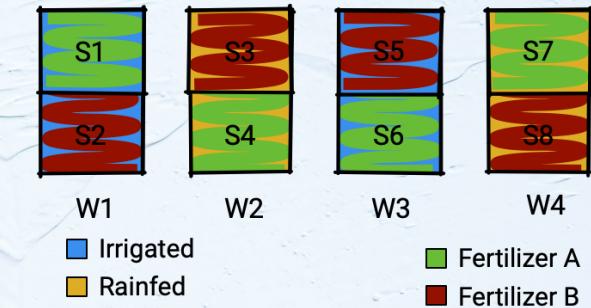
# The *new kid* on the block: edibble

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library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4,
            subplot = nested_in(wholeplot, 2)) %>%
  set_trts(water = c("irrigated", "rainfed"),
            fertilizer = c("A", "B"))) %>%
  allocate_trts(water ~ wholeplot,
                fertilizer ~ subplot)
```



# The *new kid* on the block: edibble

```
library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4,
            subplot = nested_in(wholeplot, 2)) %>%
  set_trts(water = c("irrigated", "rainfed"),
            fertilizer = c("A", "B"))) %>%
  allocate_trts(water ~ wholeplot,
                fertilizer ~ subplot) %>%
  randomise_trts()
```



# The *new kid* on the block: edibble

```
library(edibble)
start_design("split-plot") %>%
  set_units(wholeplot = 4,
            subplot = nested_in(wholeplot, 2)) %>%
  set_trts(water = c("irrigated", "rainfed"),
            fertilizer = c("A", "B")) %>%
  allocate_trts(water ~ wholeplot,
                fertilizer ~ subplot) %>%
  randomise_trts() %>%
  serve_table()
```

wholeplot	subplot	fertilizer	water
wholeplot1	subplot1	B	rainfed
wholeplot1	subplot2	A	irrigated
wholeplot2	subplot3	B	irrigated
wholeplot2	subplot4	A	irrigated
wholeplot3	subplot5	A	irrigated
wholeplot3	subplot6	B	irrigated
wholeplot4	subplot7	B	rainfed
wholeplot4	subplot8	A	rainfed

# Grammar of Experimental Designs

*Coming soon to an experiment near you*

<https://github.com/emitanaka/edibble>