

# SeriesTemporales.R

orali

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```
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#
#Proyec: Series de tiempo
#
```

```
dat <- read.csv("C:/Users/orali/OneDrive/Escritorio/Trimestre 25-I/Prog_Web/expo/SeriesDeTiempo/Base_Español.csv")
head(dat)
```

##	Año	area_cos	producción	precio	valor	fen_niño
## 1	1993	17671	97322	1.18	2	Niño Moderado
## 2	1994	17705	131387	1.19	1	Niño débil
## 3	1995	20126	108138	1.57	6	Niña debil
## 4	1996	22582	127598	1.88	7	Niña moderado
## 5	1997	16619	144654	1.90	4	Niño muy fuerte
## 6	1998	15972	137943	2.09	3	Niño fuerte

```
#install.packages("tidyverse")
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 4.4.3
```

```
## Warning: package 'ggplot2' was built under R version 4.4.3
```

```
## Warning: package 'tidyr' was built under R version 4.4.3
```

```
## Warning: package 'readr' was built under R version 4.4.3
```

```
## Warning: package 'dplyr' was built under R version 4.4.3
```

```
## Warning: package 'stringr' was built under R version 4.4.3
```

```
## Warning: package 'forcats' was built under R version 4.4.3
```

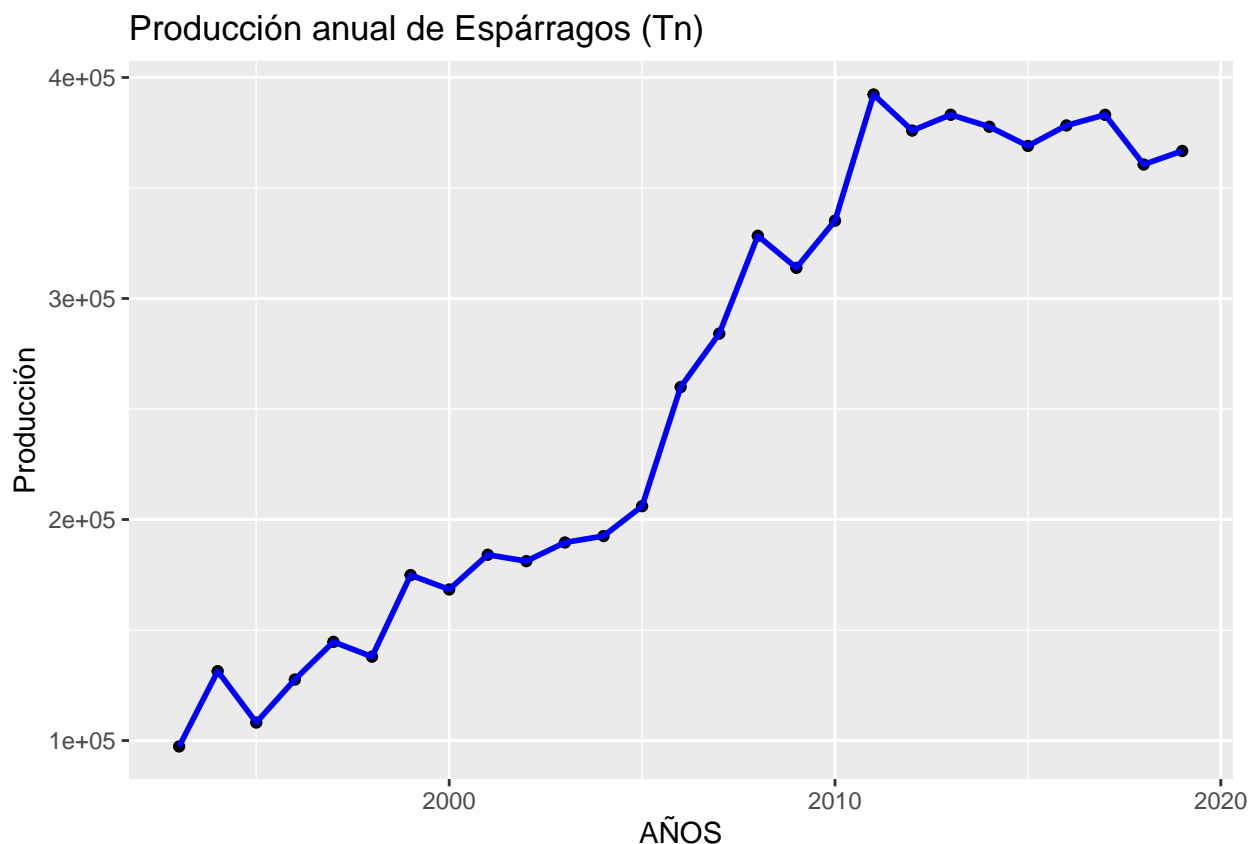
```
## Warning: package 'lubridate' was built under R version 4.4.3
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr      1.1.4      v readr      2.1.5
## v forcats    1.0.0      v stringr    1.5.1
```

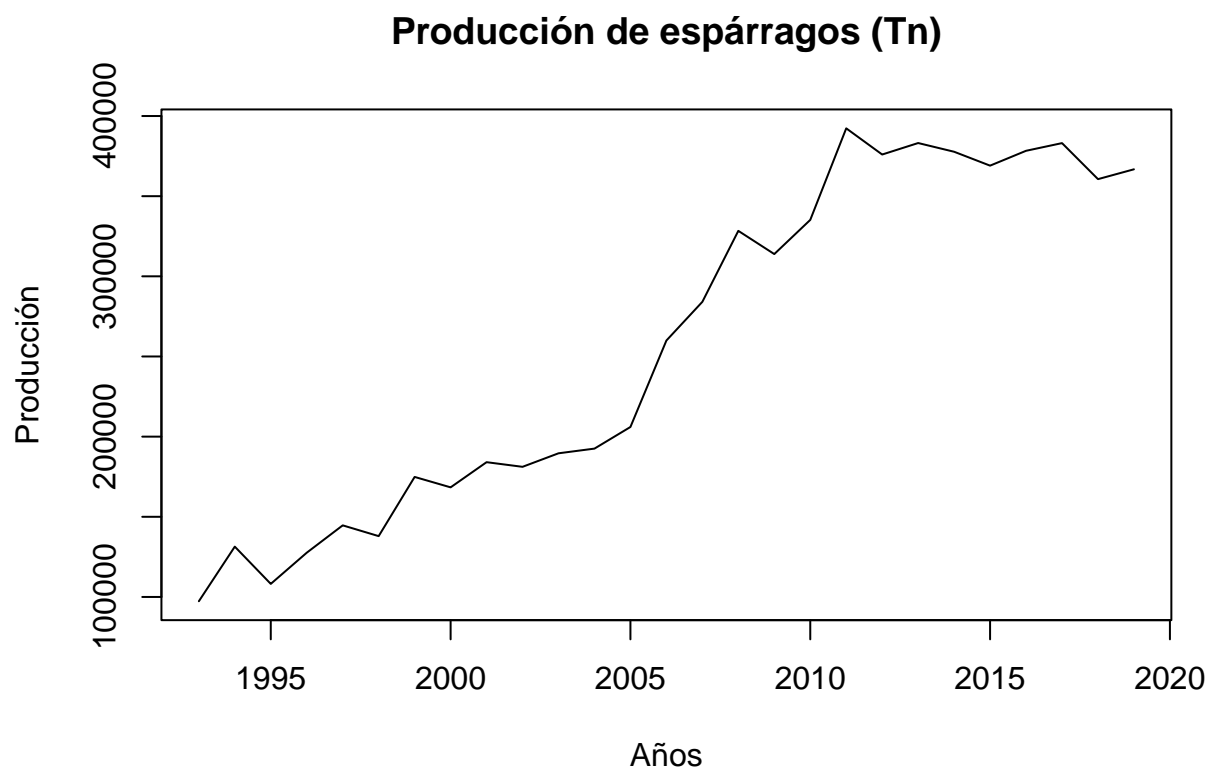
```
## v ggplot2 3.5.2      v tibble 3.2.1
## v lubridate 1.9.4    v tidyr 1.3.1
## v purrr 1.0.2
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag() masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
ggplot(data = dat, mapping = aes(x = Año, y = producción)) +
  geom_point() +
  geom_line(colour = "blue", size = 1) +
  labs(x = "AÑOS", y = "Producción",
       title = "Producción anual de Espárragos (Tn)")
```

```
## Warning: Using 'size' aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use 'linewidth' instead.
## This warning is displayed once every 8 hours.
## Call 'lifecycle::last_lifecycle_warnings()' to see where this warning was
## generated.
```

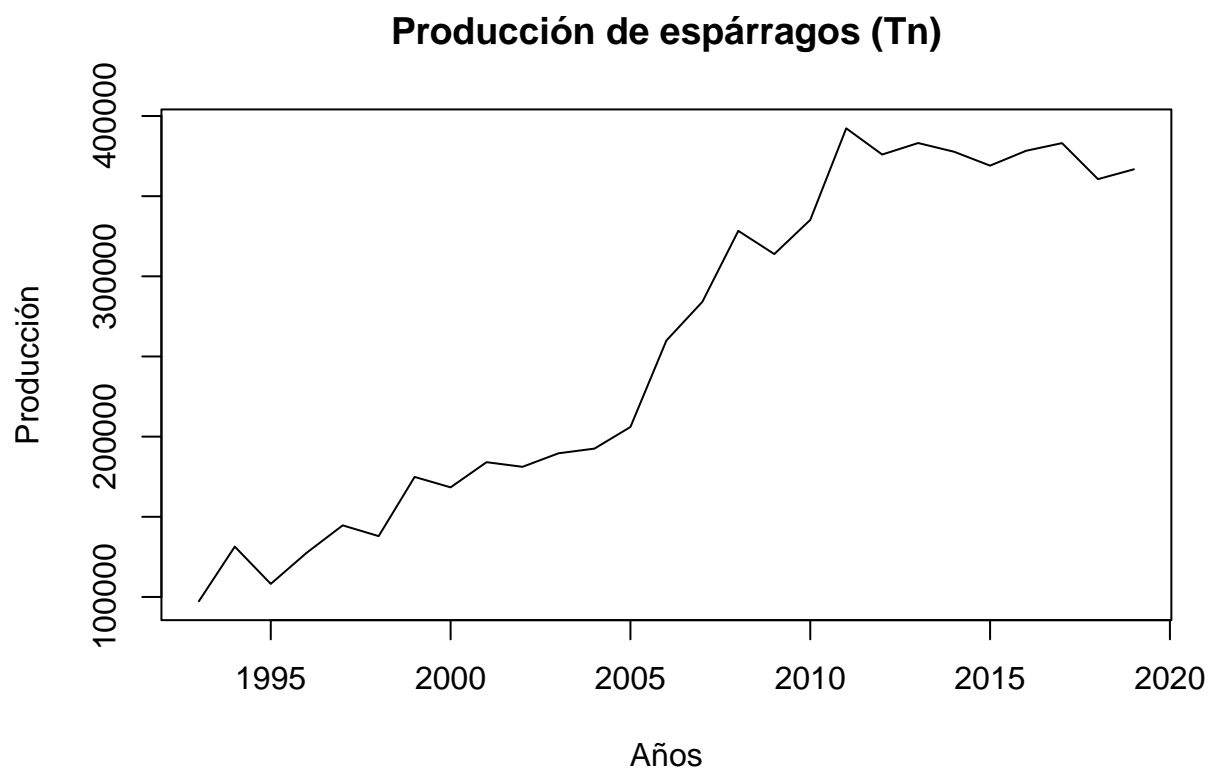


```
plot(dat$Año, dat$producción, xlab = "Años", ylab = "Producción",
     main = "Producción de espárragos (Tn)", type = "l")
```



```
# Solo tiene la variable Producción
Produccion <- dat$producción
# La serie inicia en 1993 y es de frecuencia anual
dat2 <- ts(Produccion, start = 1993, frequency = 1)

plot(dat2 , xlab = "Años", ylab = "Producción",
      main = "Producción de espárragos (Tn)", type = "l")
```



```
#La serie inicia en 1993, es anual (12) y
# hasta 2019 hay 27 años.
Fechas <- (seq(as.Date("1993-01-01"), by = "12 months", len = 27))
class(Fechas)
```

```
## [1] "Date"
```

```
dat3 <- data.frame(Fechas, Produccion)
head(dat3)
```

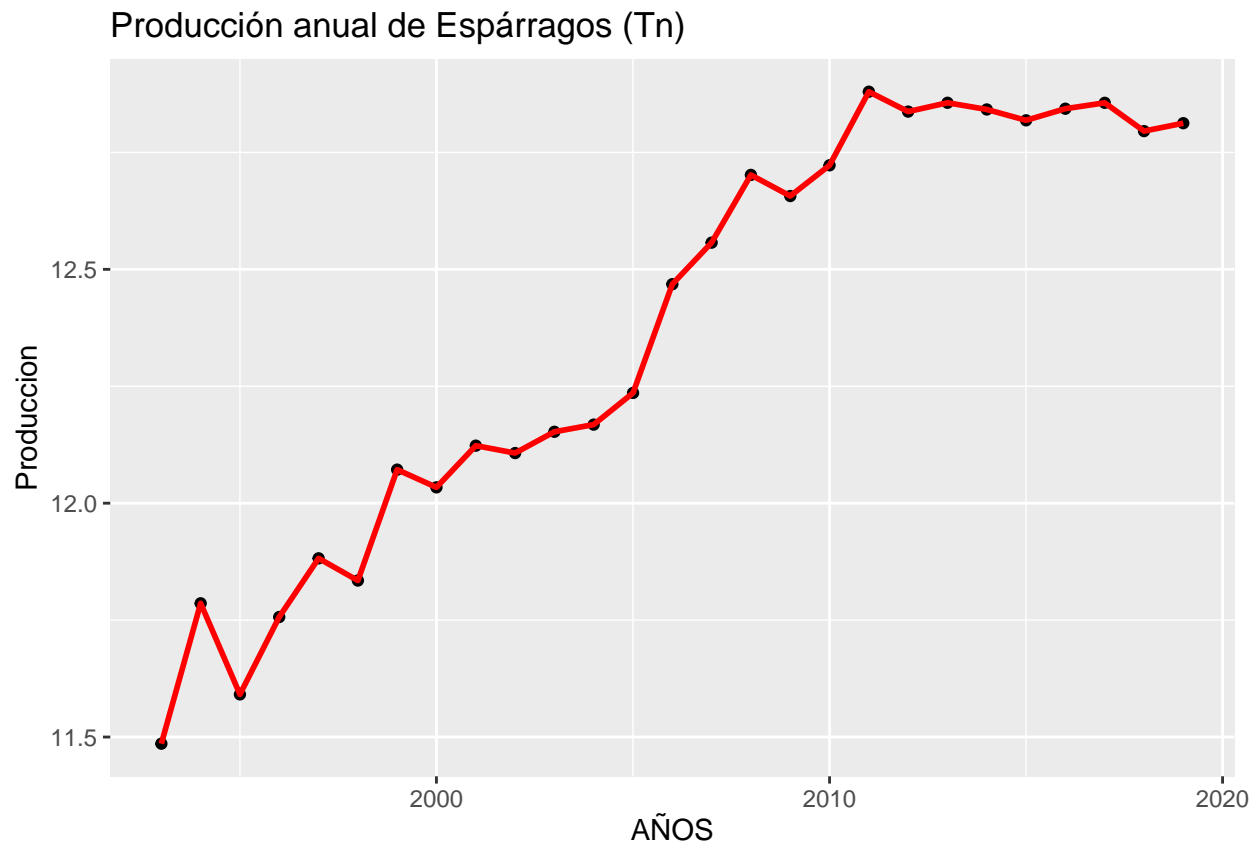
```
##      Fechas Produccion
## 1 1993-01-01      97322
## 2 1994-01-01     131387
## 3 1995-01-01     108138
## 4 1996-01-01     127598
## 5 1997-01-01     144654
## 6 1998-01-01     137943
```

```
dat3 <- data.frame(dat3[1], log(dat3[2]))
head(dat3)
```

```
##      Fechas Produccion
## 1 1993-01-01    11.48578
## 2 1994-01-01    11.78590
```

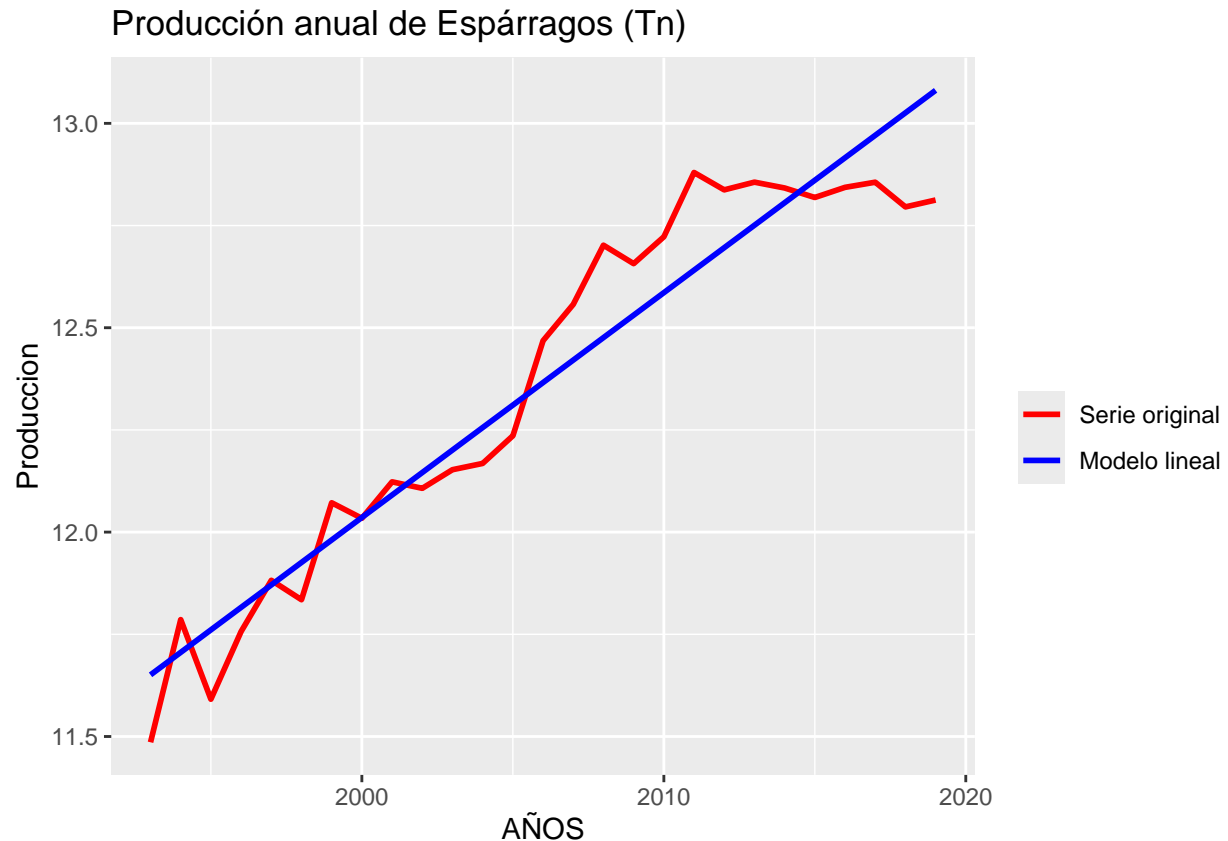
```
## 3 1995-01-01 11.59116
## 4 1996-01-01 11.75664
## 5 1997-01-01 11.88210
## 6 1998-01-01 11.83460
```

```
ggplot(data = dat3, mapping = aes(x = Fechas, y = Produccion)) +
  geom_point() +
  geom_line(colour = "red", size = 1) +
  labs(x = "AÑOS", y = "Produccion",
       title = "Producción anual de Espárragos (Tn)")
```



```
t <- 1:27
mod_lin <- summary(lm(dat3$Produccion ~ t))
# Se observa un $R^2 = 0.91$

# creación del modelo lineal
mod_1 <- coef(mod_lin)[1] + coef(mod_lin)[2]*t
# gráfica
ggplot(data = dat3, mapping = aes(x = Fechas)) +
  geom_line(aes(y = Produccion, colour = "Serie original"), size = 1) +
  geom_line(aes(y = mod_1, colour = "Modelo lineal"), size = 1) +
  labs(x = "AÑOS", y = "Produccion",
       title = "Producción anual de Espárragos (Tn)") +
  scale_color_manual("", breaks = c("Serie original", "Modelo lineal"),
                    values = c("red", "blue"))
```

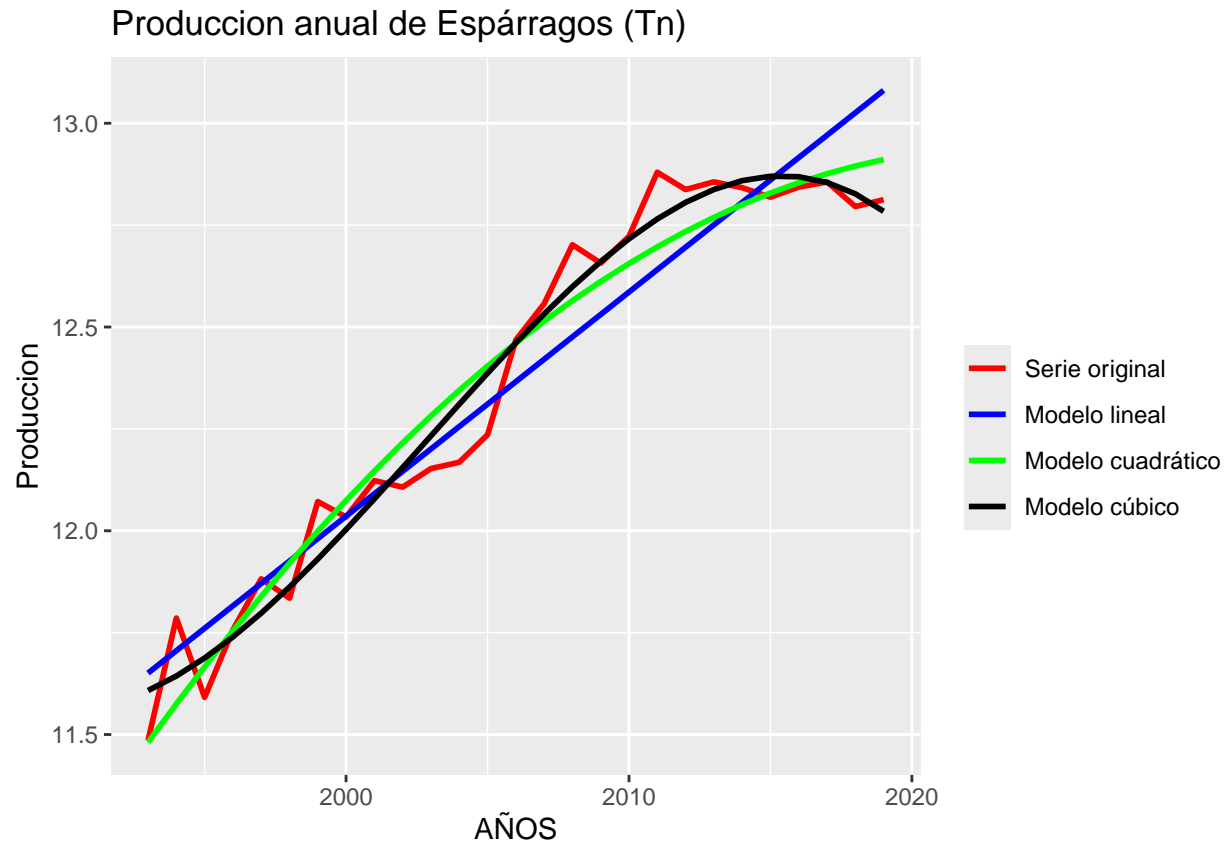


```
# modelo cuadrático
t2 <- t*t
mod_cuad <- summary(lm(dat3$Produccion ~ t + t2))
mod_2 <- coef(mod_cuad)[1] + coef(mod_cuad)[2]*t + coef(mod_cuad)[3]*t2

# modelo cúbico
t3 <- t*t*t
mod_cub <- summary(lm(dat3$Produccion ~ t + t2 + t3))

mod_3 <- coef(mod_cub)[1] + coef(mod_cub)[2]*t + coef(mod_cub)[3]*t2 + coef(mod_cub)[4]*t3

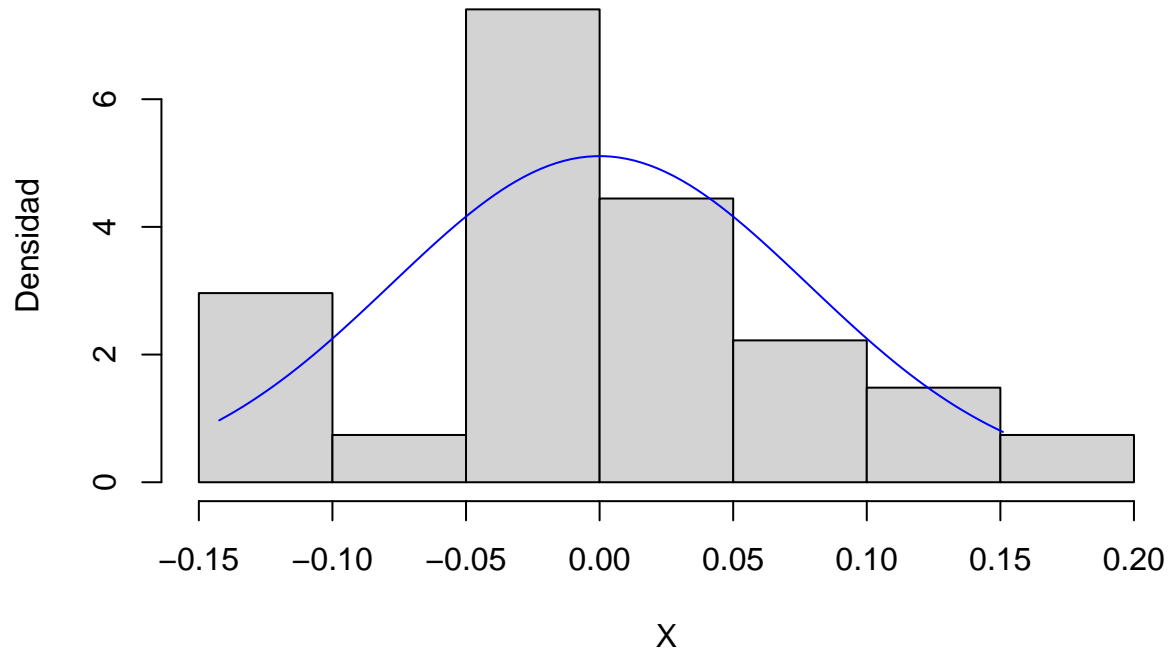
# gráfica
ggplot(data = dat3, mapping = aes(x = Fechas)) +
  geom_line(aes(y = Produccion, colour = "Serie original"), size = 1) +
  geom_line(aes(y = mod_1, colour = "Modelo lineal"), size = 1) +
  geom_line(aes(y = mod_2, colour = "Modelo cuadrático"), size = 1) +
  geom_line(aes(y = mod_3, colour = "Modelo cúbico"), size = 1) +
  labs(x = "AÑOS", y = "Produccion",
       title = "Produccion anual de Espárragos (Tn)") +
  scale_color_manual("",
                    breaks = c("Serie original", "Modelo lineal",
                              "Modelo cuadrático", "Modelo cúbico"),
                    values = c("red", "blue", "green", "black"))
```



```
errores <- mod_3 - dat3$Produccion

plotn <- function(x,main="Histograma de frecuencias \n y distribución normal",
                  xlab="X",ylab="Densidad") {
  min <- min(x)
  max <- max(x)
  media <- mean(x)
  dt <- sd(x)
  hist(x,freq=F,main=main,xlab=xlab,ylab=ylab)
  curve(dnorm(x,media,dt), min, max,add = T,col="blue")
}
plotn(errores,main="Distribución normal")
```

## Distribución normal



```
# Test de normalidad darque Bera
#install.packages("tseries")
library("tseries")
```

```
## Warning: package 'tseries' was built under R version 4.4.3
```

```
## Registered S3 method overwritten by 'quantmod':
##   method      from
##   as.zoo.data.frame zoo
```

```
jarque.bera.testerrores)
```

```
##
## Jarque Bera Test
##
## data: errores
## X-squared = 0.17484, df = 2, p-value = 0.9163
```

```
#####
```

```
#
```