

# **Reporte de Modelos — Zapopan**

Ciclos incluidos: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024

Generado: 2025-09-30 17:27

## **Zapopan — 2010**

Días del ciclo: 161

ETc total [mm]: 633.5

ETverde total [mm]: 343.7

ETazul total [mm]: 289.7

Tmax / Tmin [°C]: 36.3 / 7.2

## Zapopan — 2010 · Resultados y métricas

[Zapopan 2010] Regresión Lineal ET0 — R<sup>2</sup>: 0.9889 MSE: 0.0260

[Zapopan 2010] Random Forest ET0 — R<sup>2</sup>: 0.9882 MSE: 0.0275

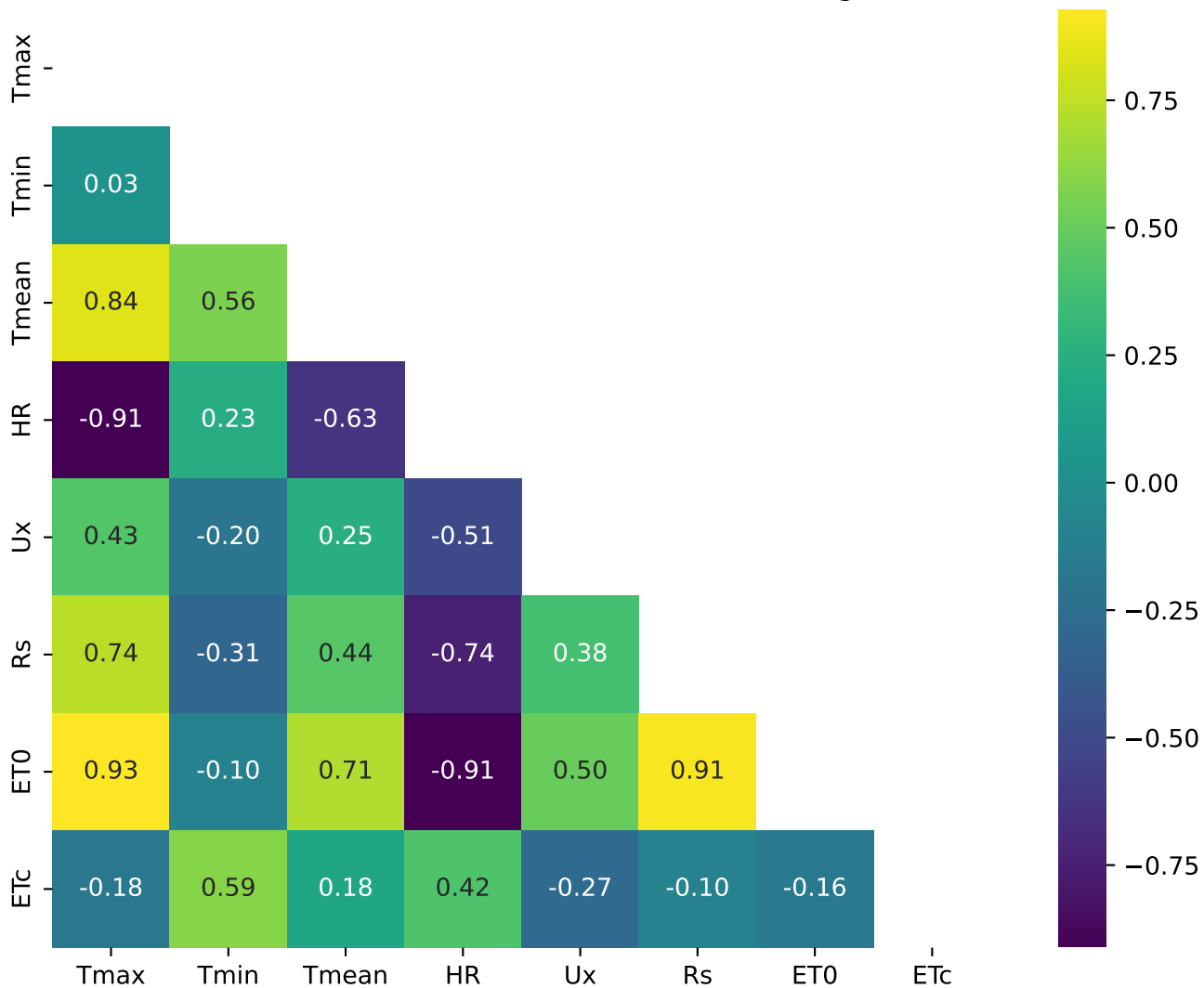
Importancias: {'Tmax': 0.7044988247173384, 'Tmin': 0.005283358847502085, 'HR': 0.04124613718585054, 'Ux': 0.011306272511272366, 'Rs': 0.2376654067380366}

Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	25.040000	16.802333	82.266333	1.396667	15.326667	3.311990	3.561632
1	35.048276	15.360345	34.058966	1.775172	27.991724	7.370046	2.211014
2	28.895926	16.792222	69.698519	1.372593	24.350000	5.262315	6.314778
3	25.908182	10.837727	67.299091	1.424091	23.099091	4.411742	1.544110
4	26.398302	16.766415	78.851698	1.073585	20.311321	4.214545	4.868186

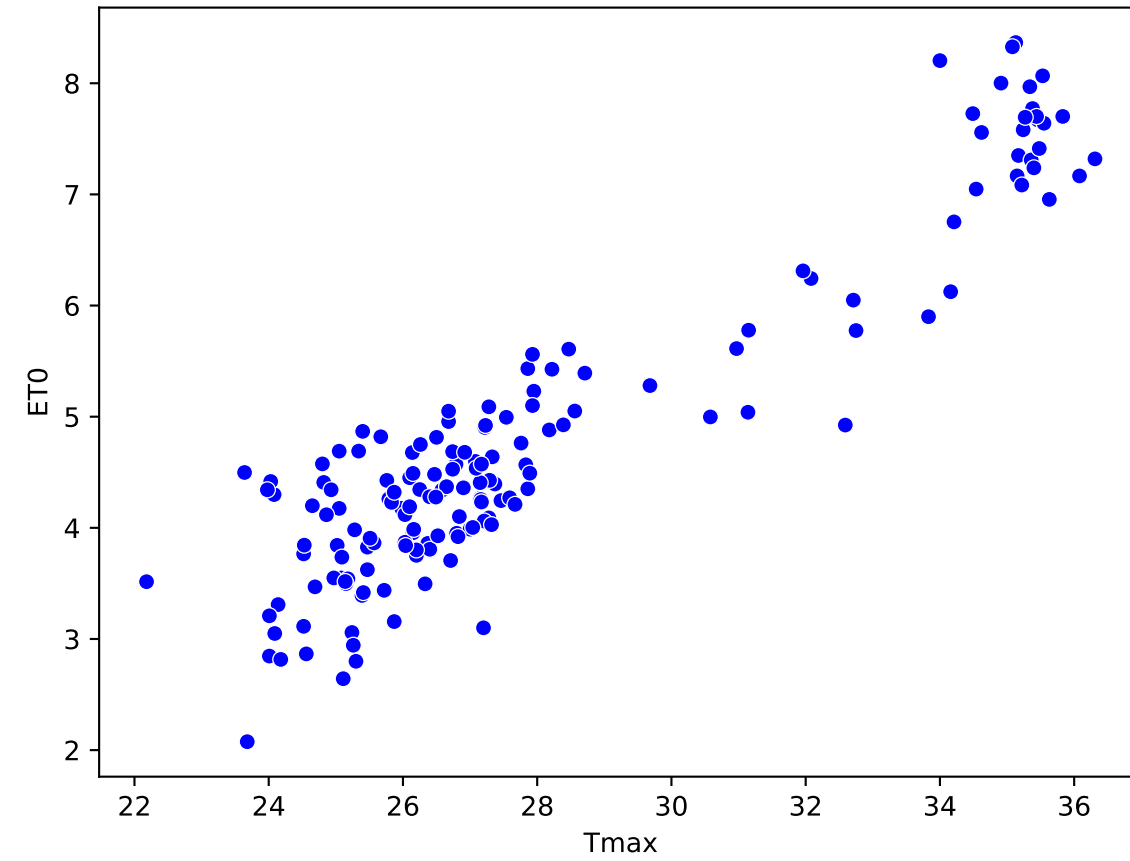
**Zapopan — 2010**

Matriz de Correlación entre Variables Meteorológicas

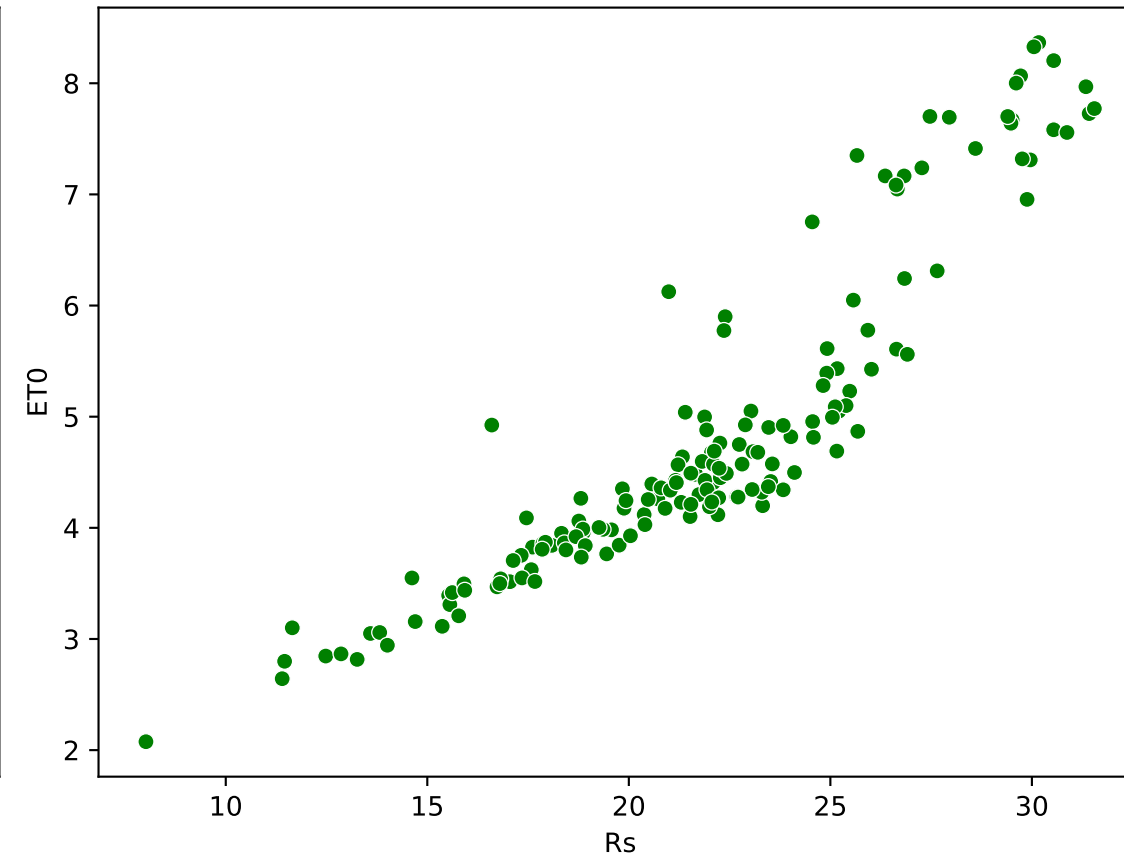


# Dispersión — Zapopan (2010)

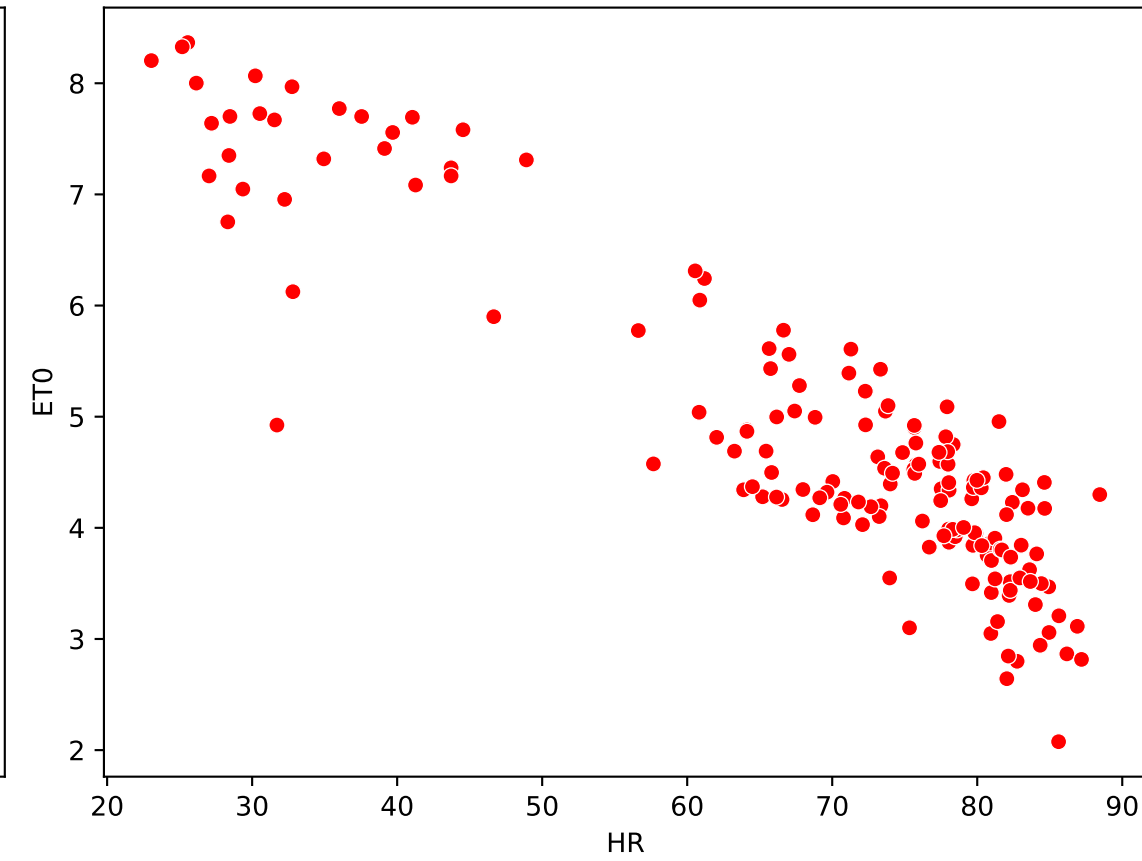
Tmax vs ET0



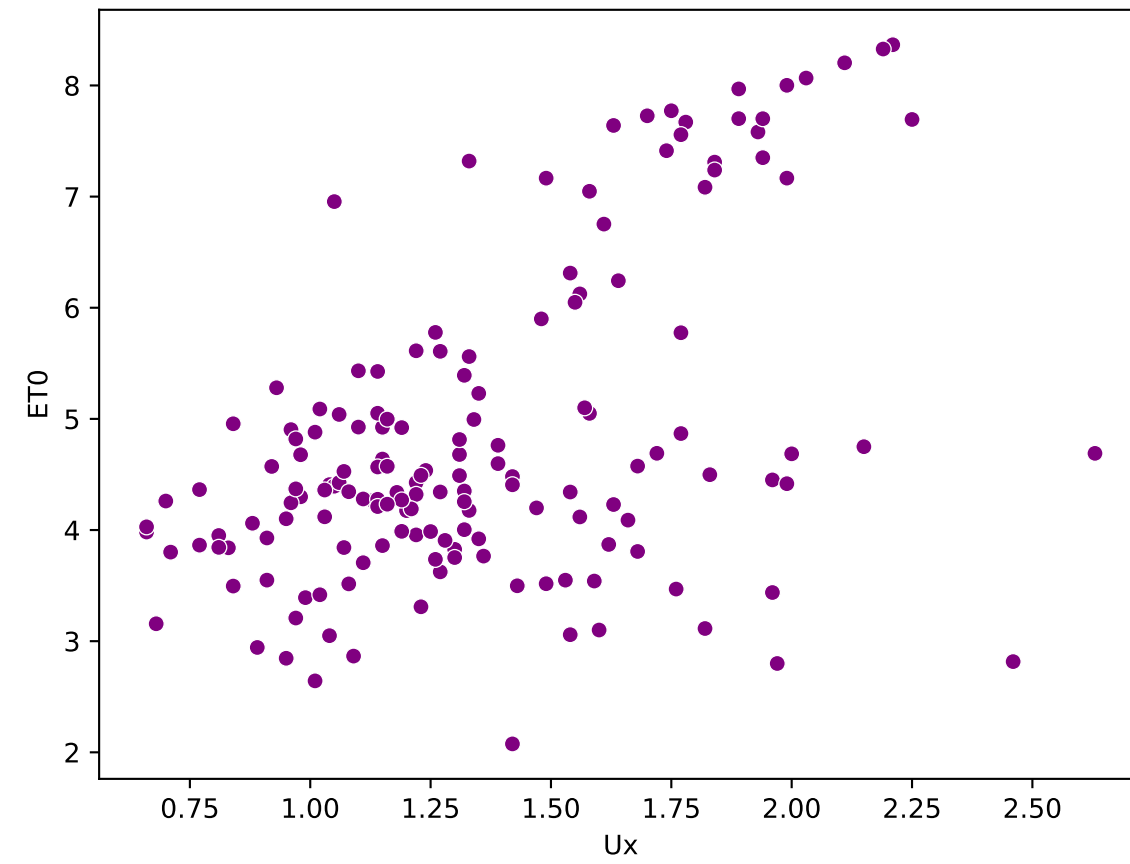
Rs vs ET0



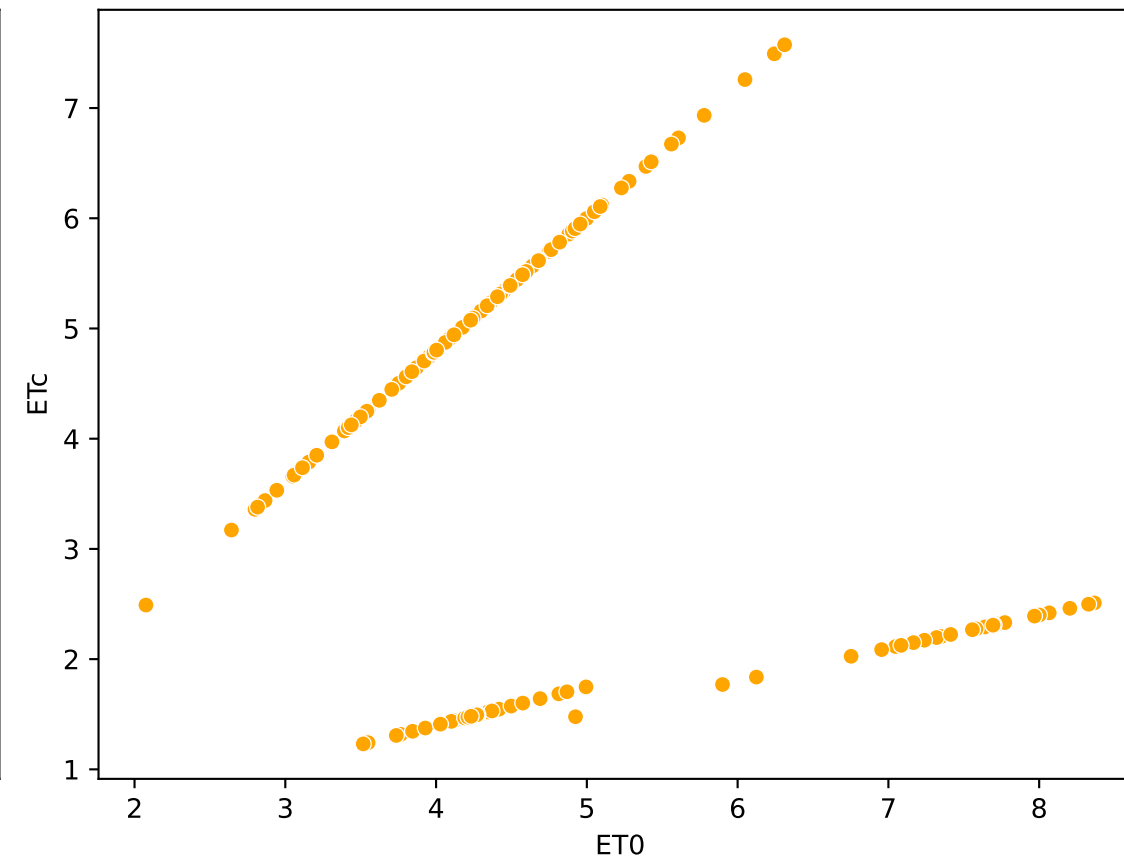
HR vs ET0



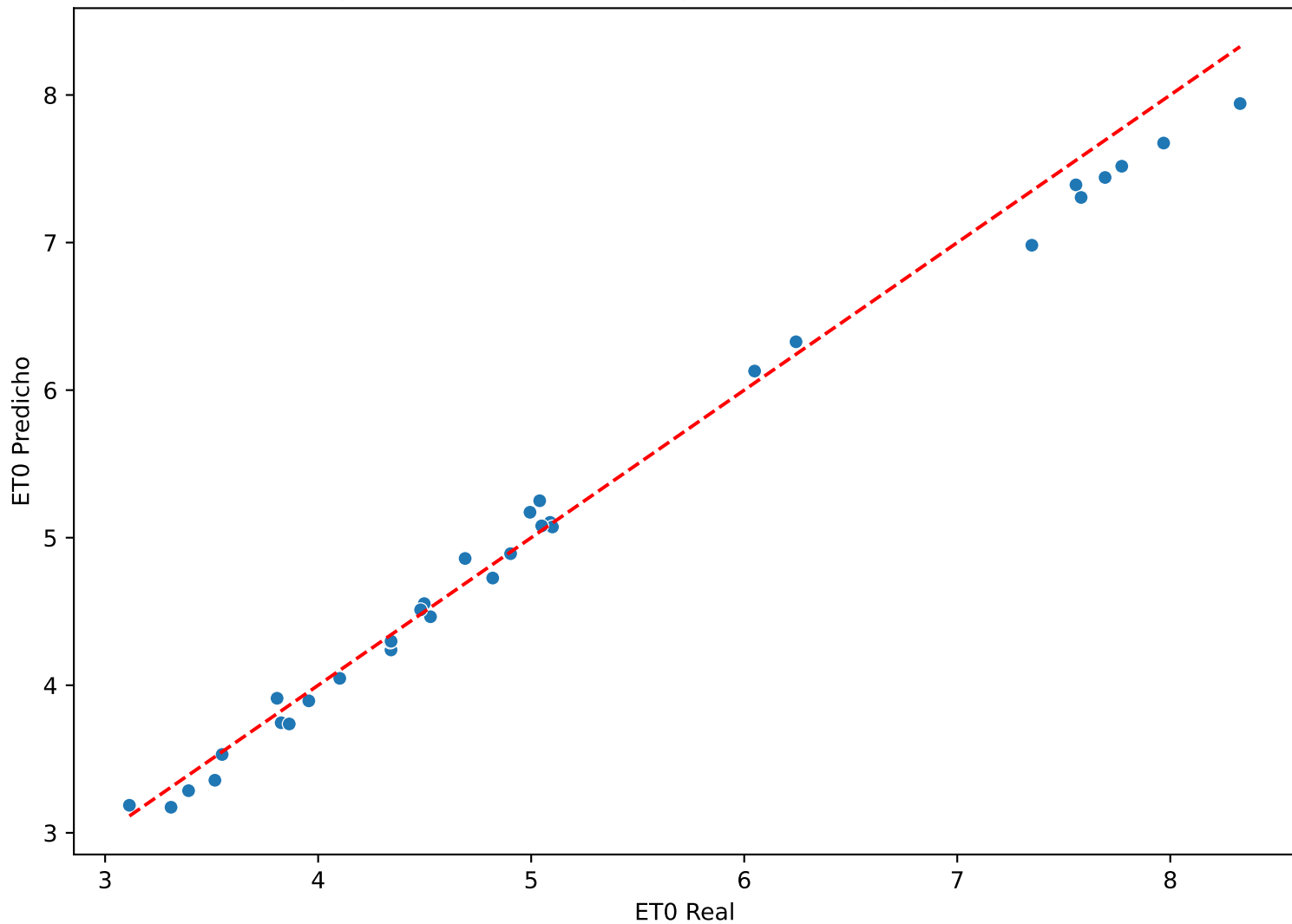
Ux vs ET0



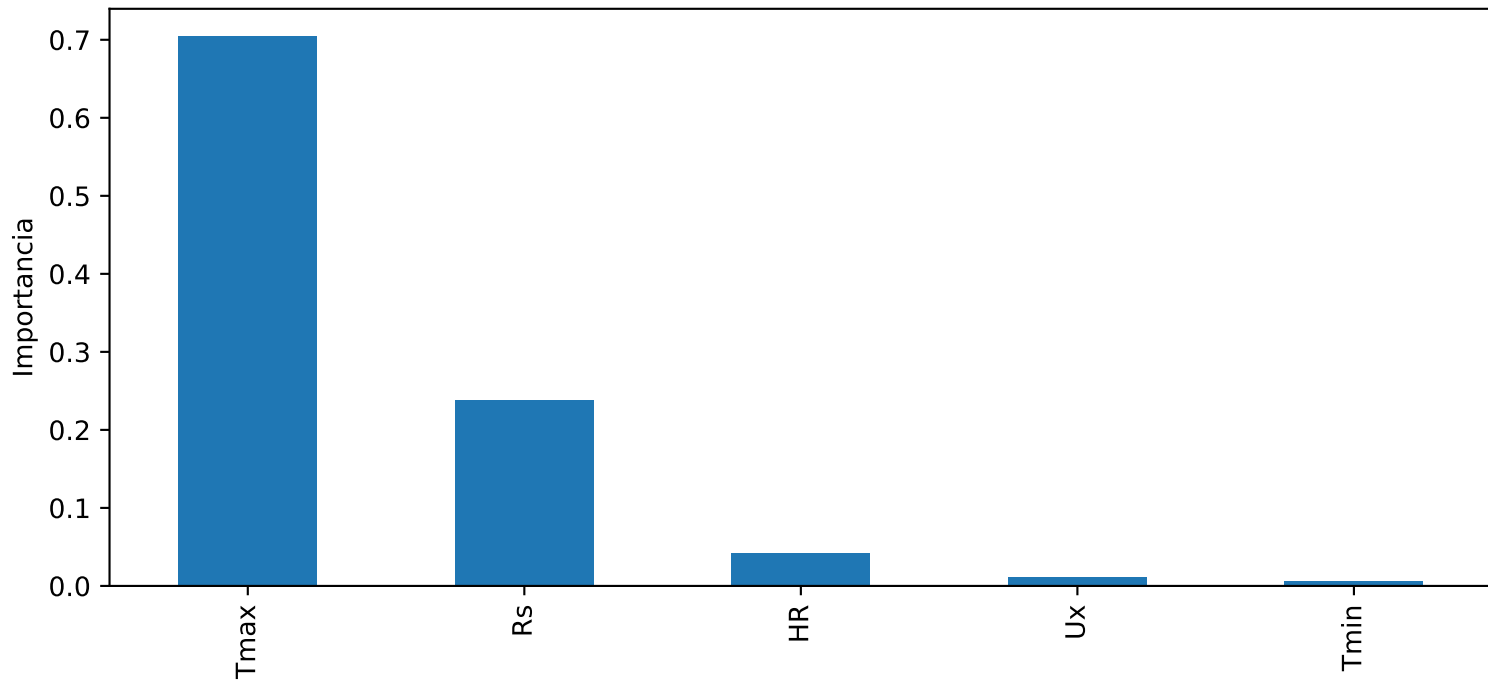
ET0 vs ETc



Comparación entre ET0 Real y Predicho — Zapopan (2010)

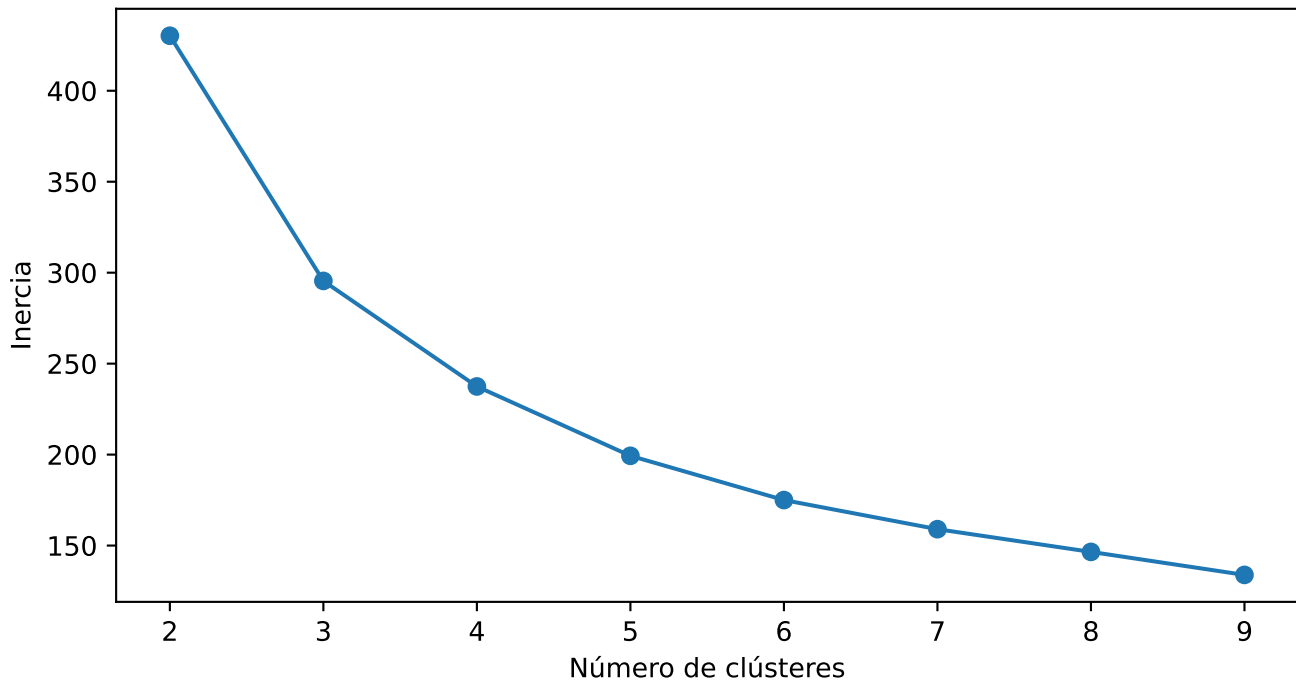


Importancia de variables (RF) — Zapopan (2010)

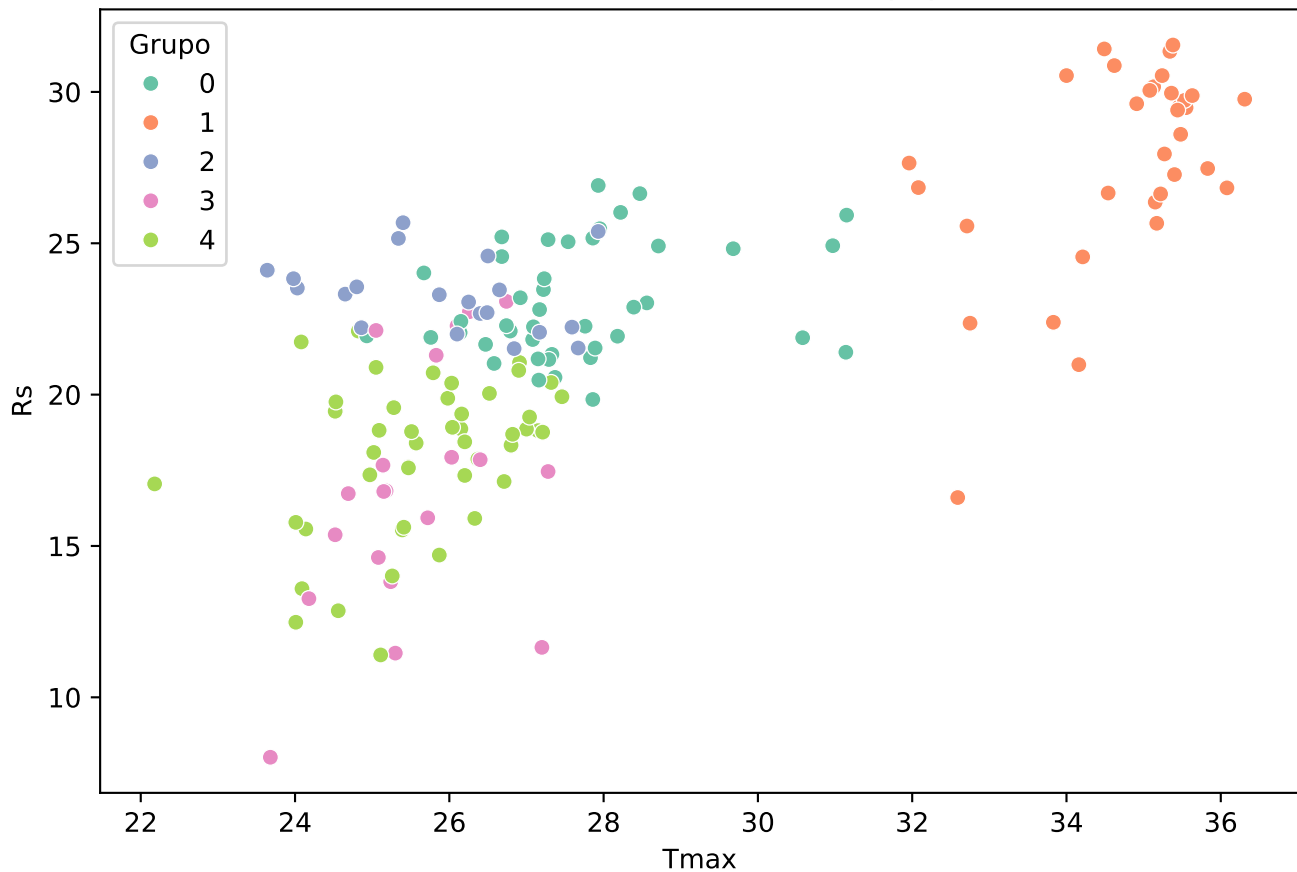




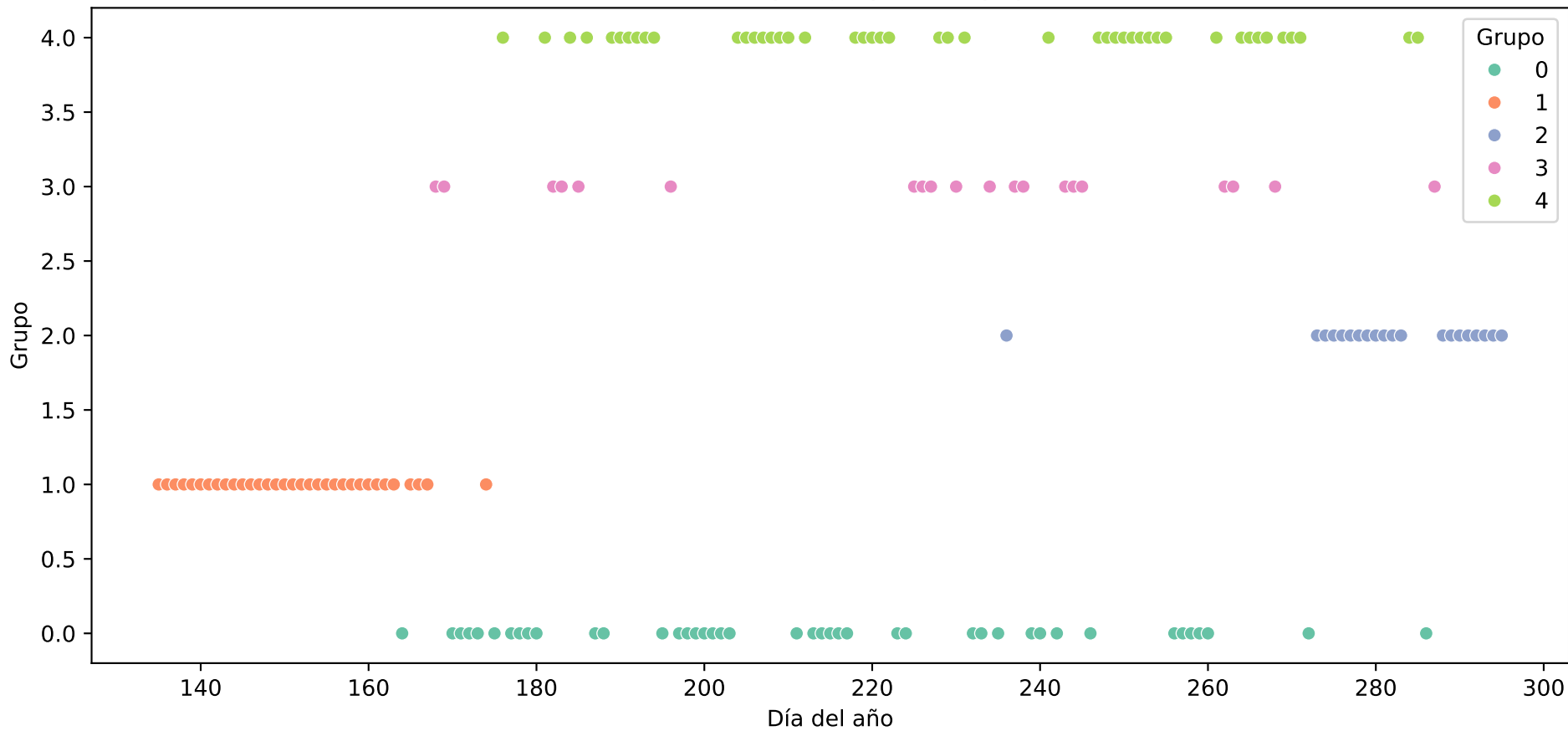
## Método del codo



Clasificación de días climáticos — Zapopan (2010)

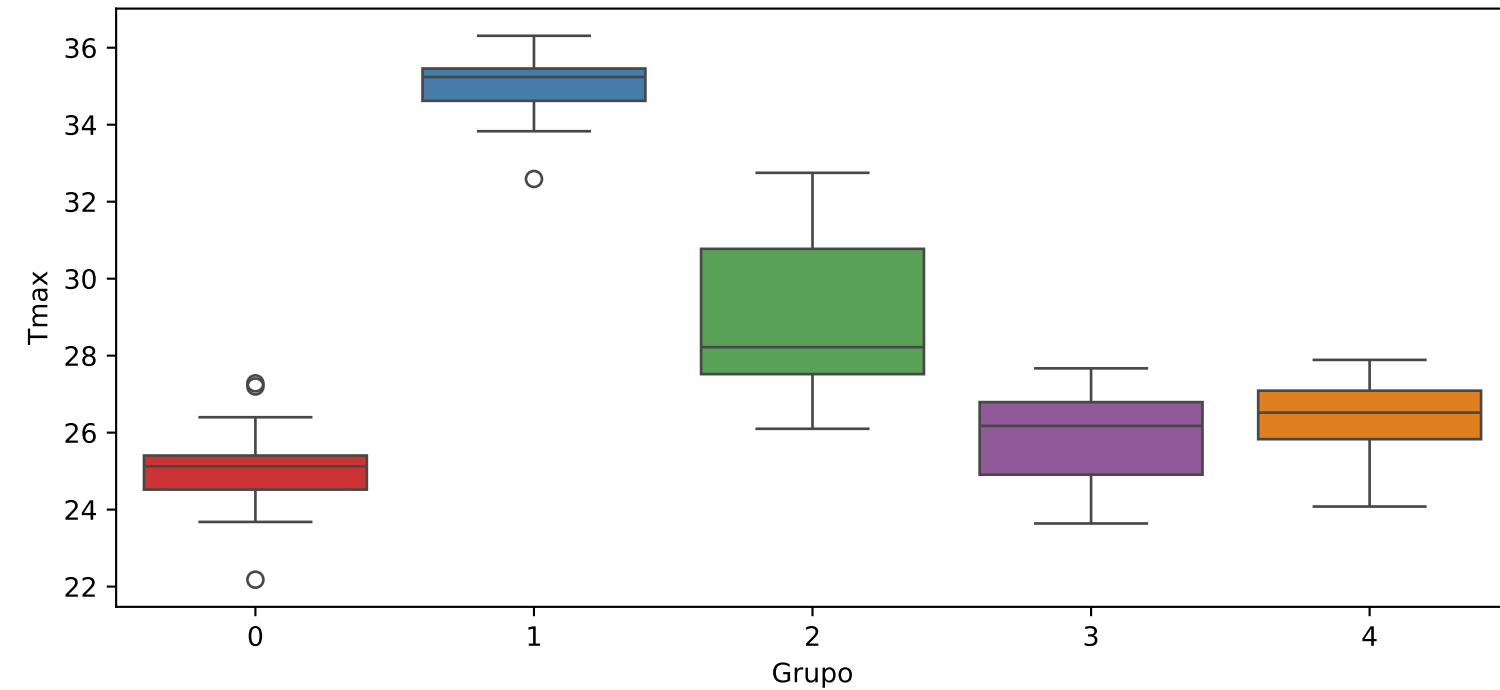


Distribución de días por grupo — Zapopan (2010)

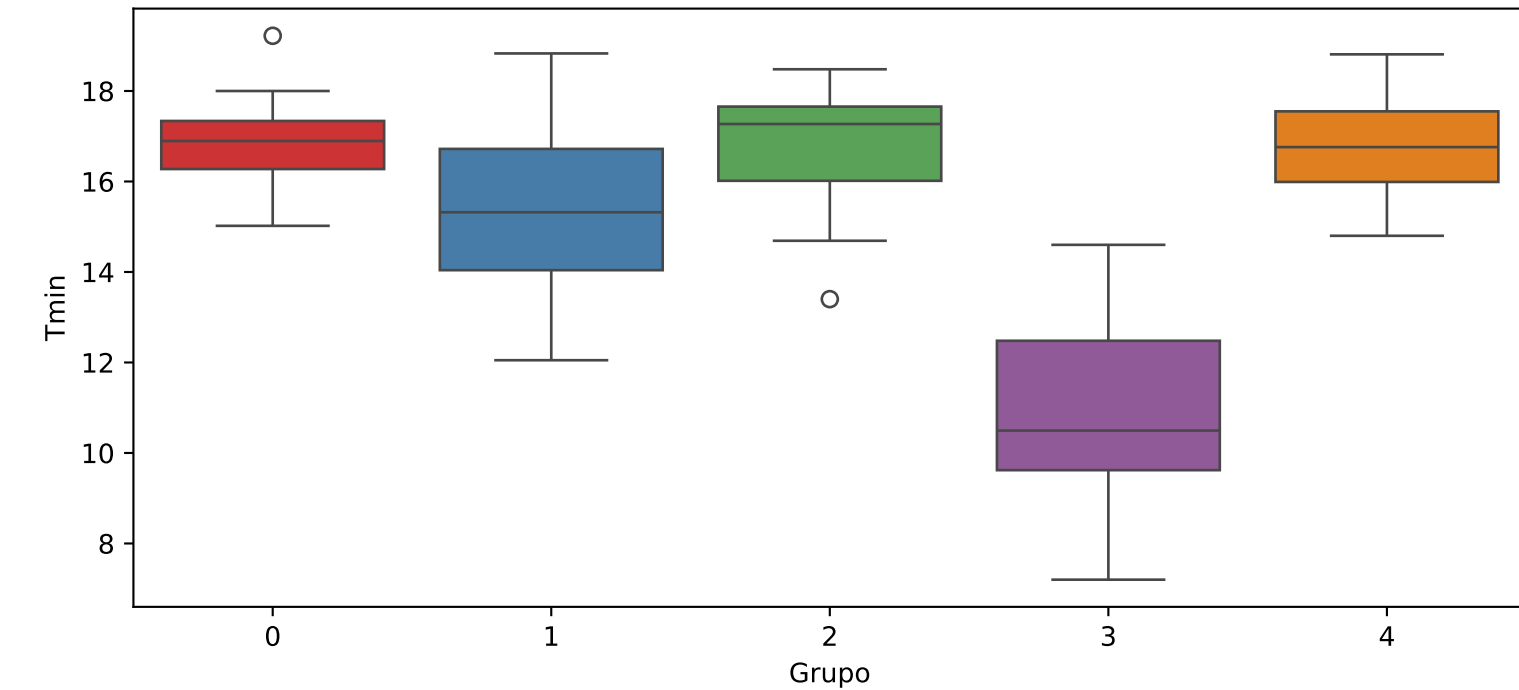


# Boxplots por grupo — Zapopan (2010)

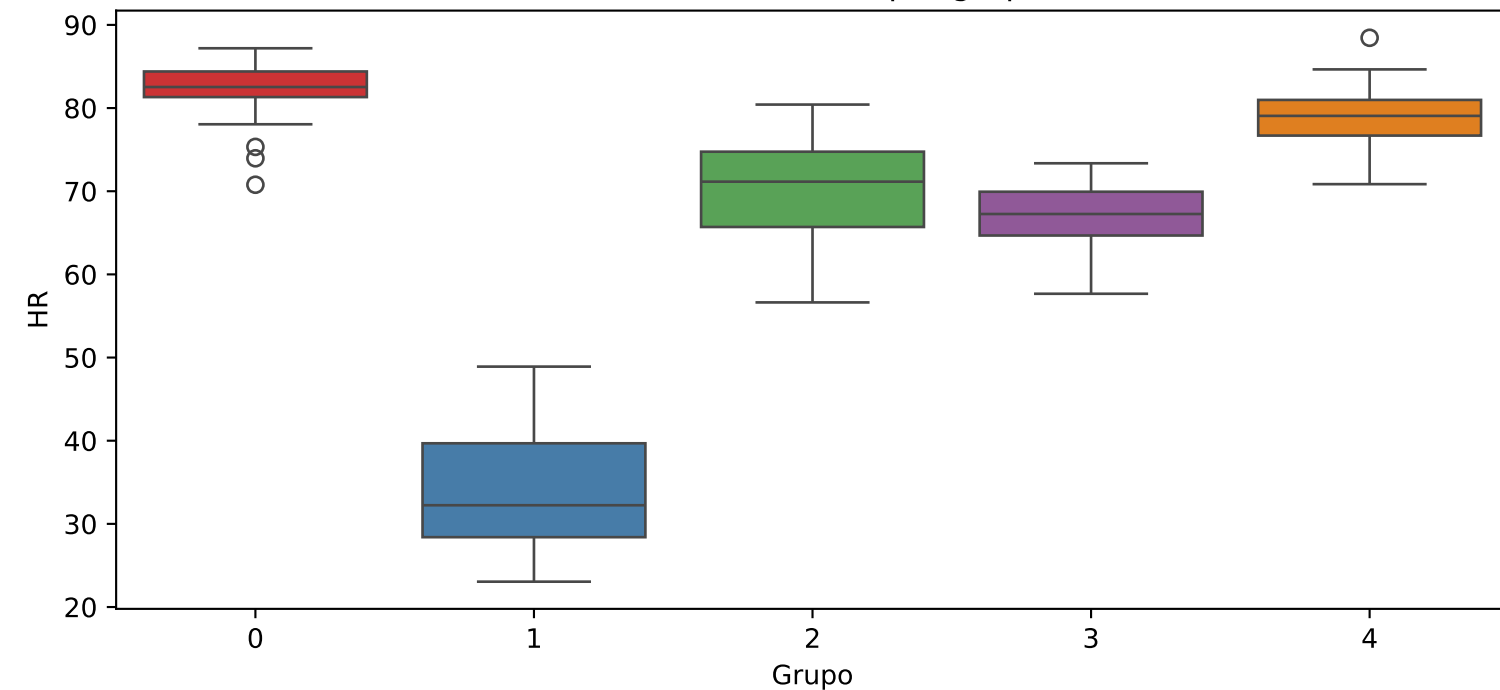
## Distribución de Tmax por grupo



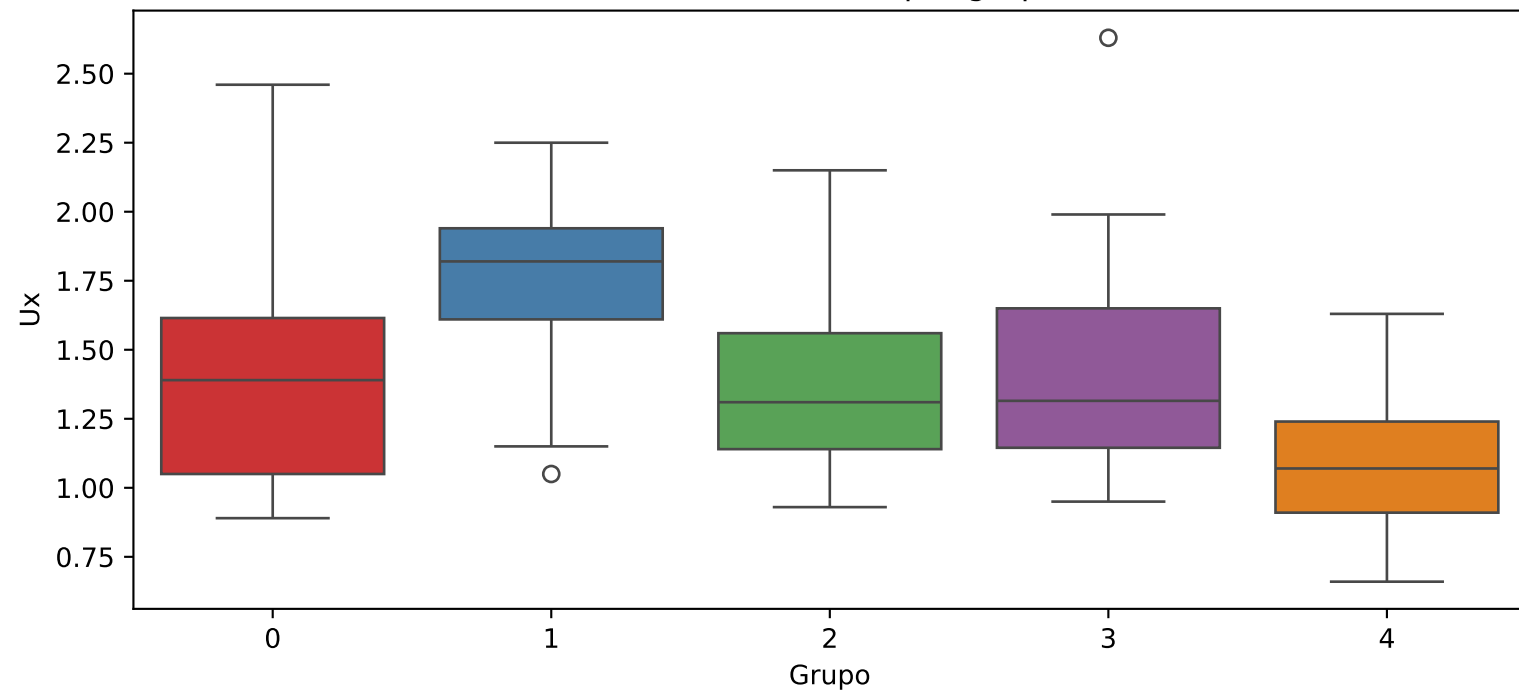
## Distribución de Tmin por grupo



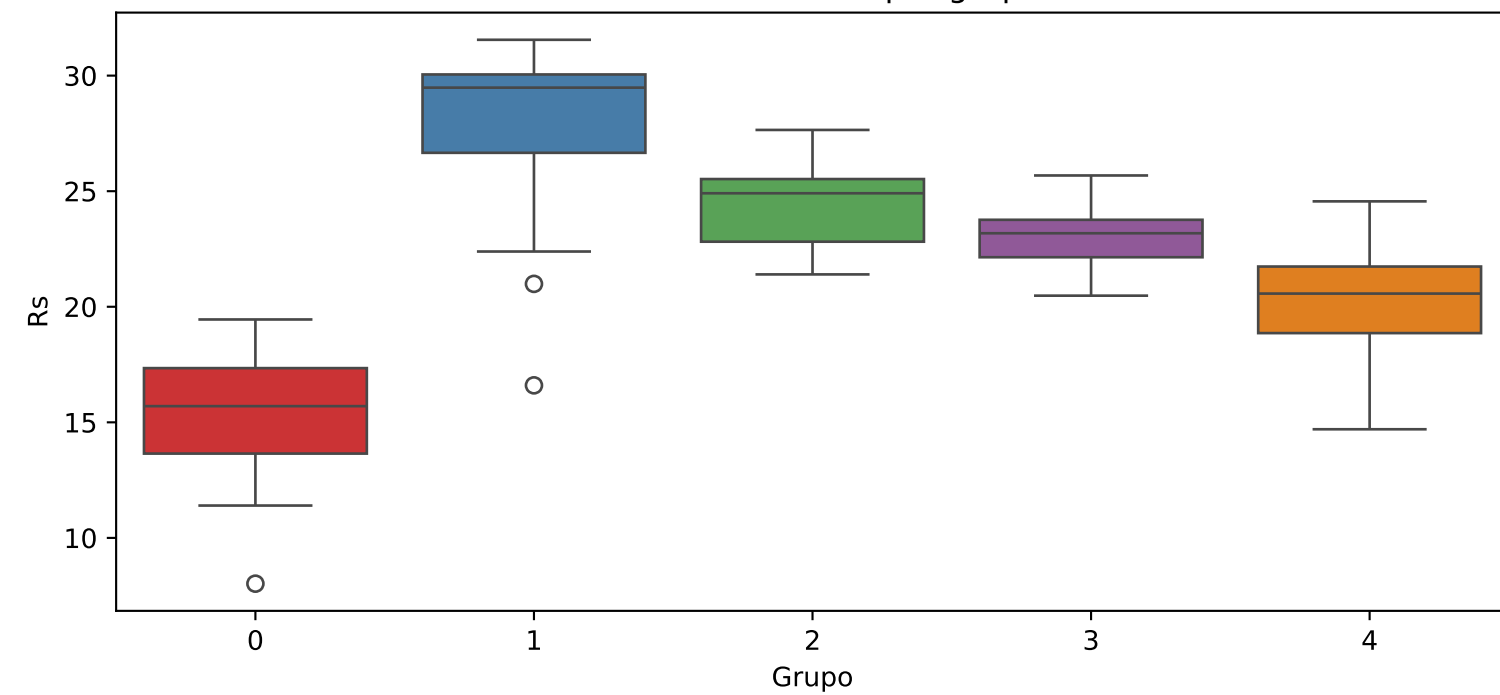
## Distribución de HR por grupo



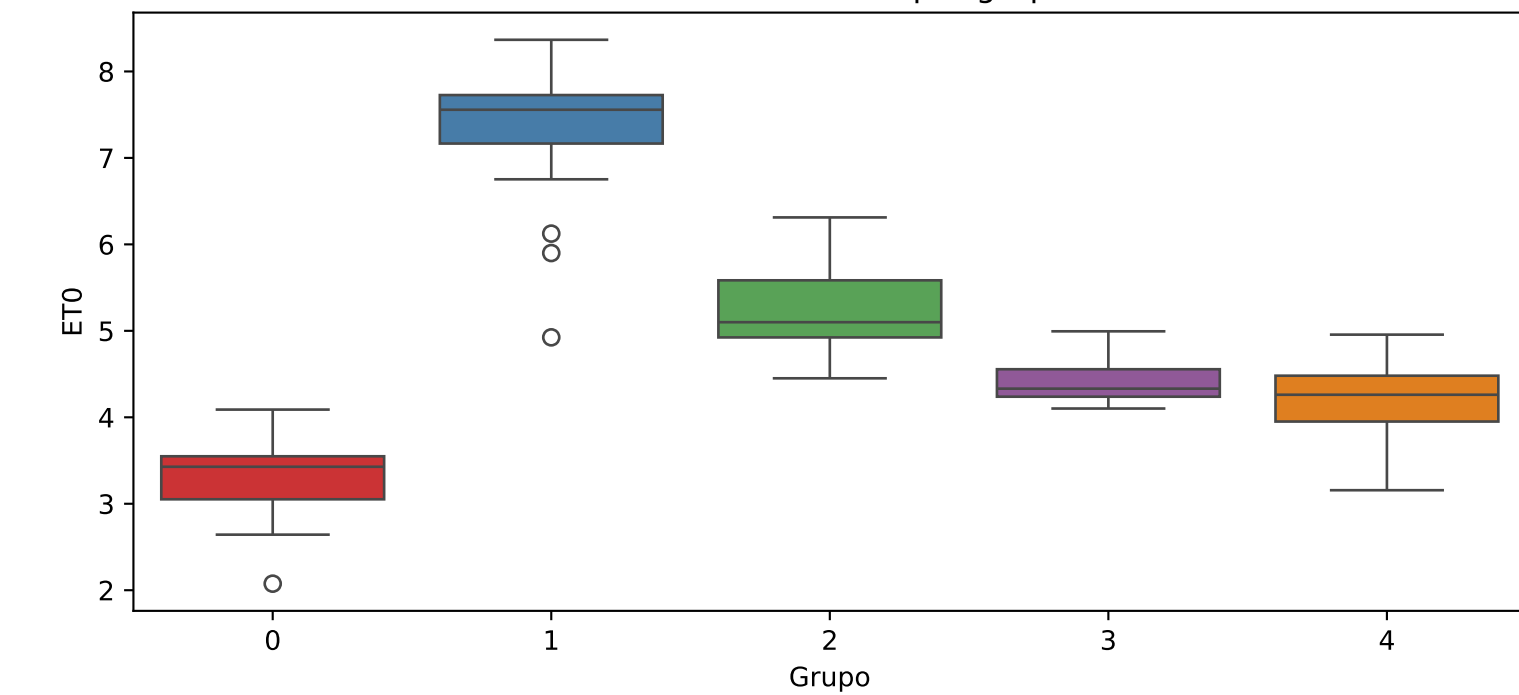
## Distribución de Ux por grupo



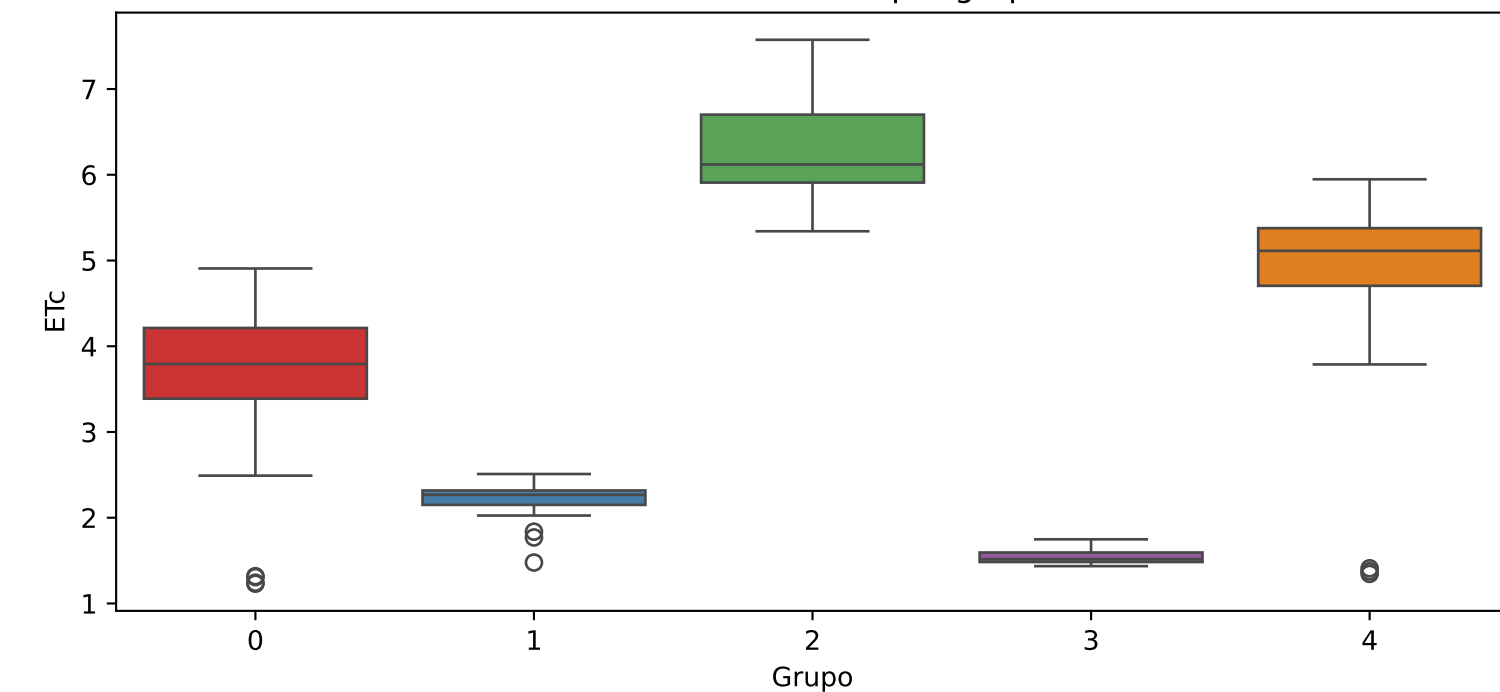
## Distribución de Rs por grupo



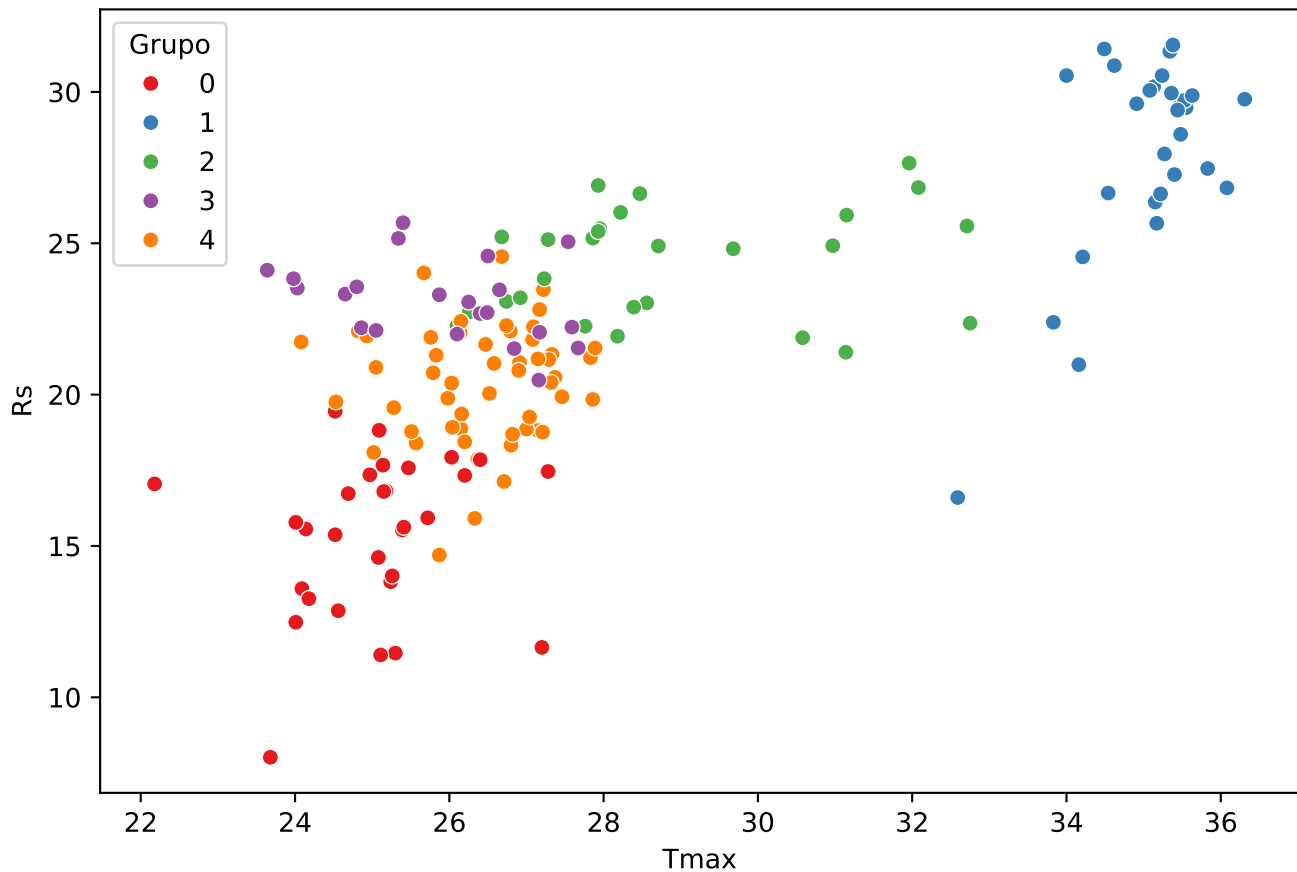
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2010)



## **Zapopan — 2011**

Días del ciclo: 161

ETc total [mm]: 654.4

ETverde total [mm]: 315.3

ETazul total [mm]: 339.0

Tmax / Tmin [°C]: 38.4 / 7.6

## Zapopan — 2011 · Resultados y métricas

[Zapopan 2011] Regresión Lineal ET0 —  $R^2$ : 0.9914 MSE: 0.0202

[Zapopan 2011] Random Forest ET0 —  $R^2$ : 0.9879 MSE: 0.0286

Importancias: {'Tmax': 0.4466614673688763, 'Tmin': 0.005859642409359775, 'HR': 0.26259567407702916, 'Ux': 0.00938597505811754, 'Rs': 0.2754972410866173}

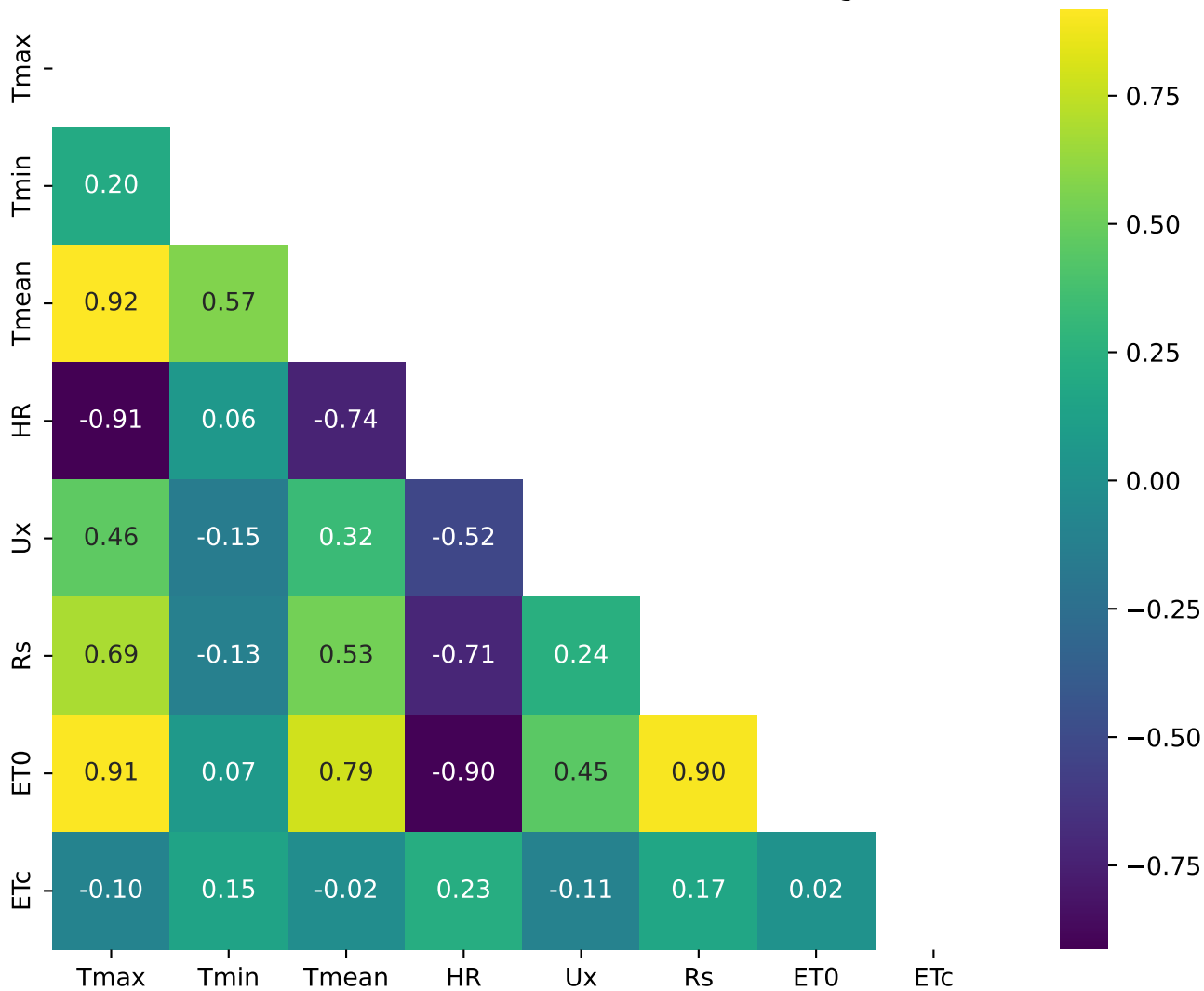
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	34.066250	18.306250	53.985000	1.645000	25.110000	6.349340	7.619208
1	24.920833	16.410000	80.603333	1.241250	15.934375	3.393555	2.966777
2	35.485517	16.696552	40.608966	1.813793	28.014138	7.343575	2.203072
3	26.094375	11.355625	64.644375	1.533125	24.061875	4.688914	3.039121
4	26.737333	16.522667	76.834500	1.208333	22.834500	4.701299	5.641558

**Zapopan — 2011**

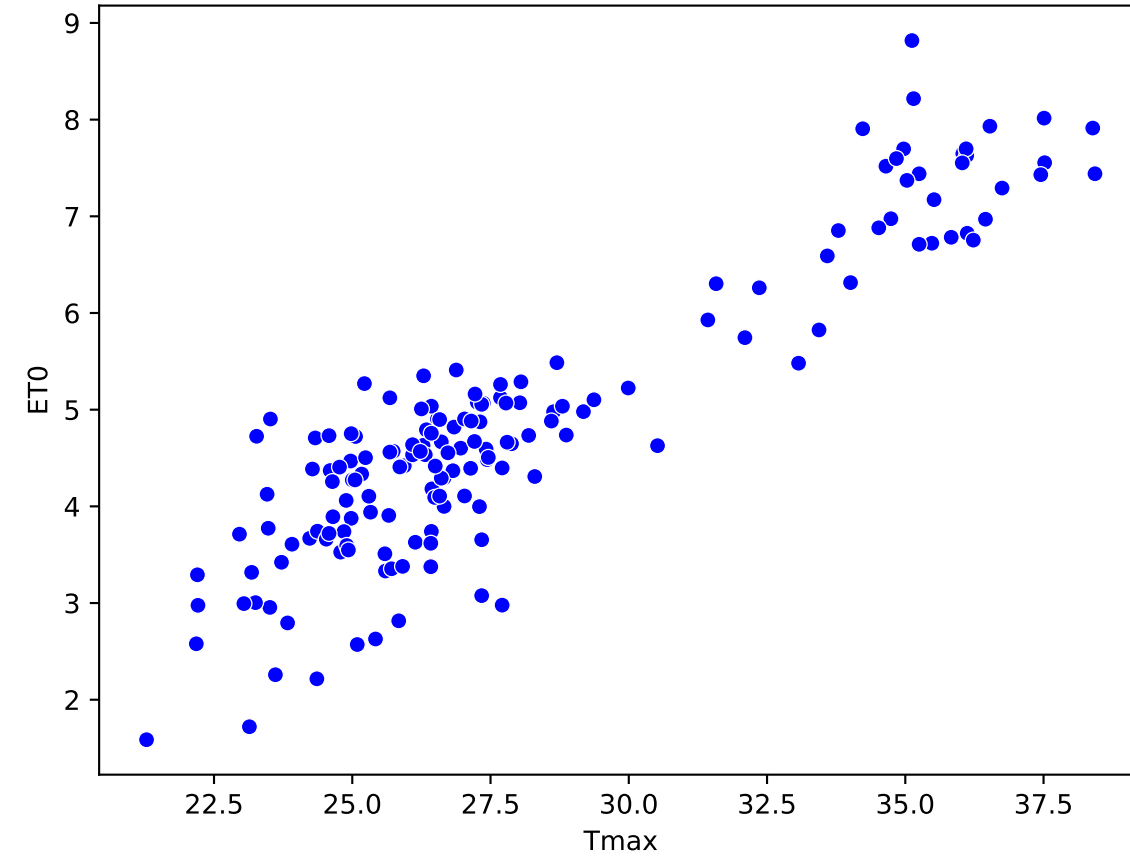


Matriz de Correlación entre Variables Meteorológicas

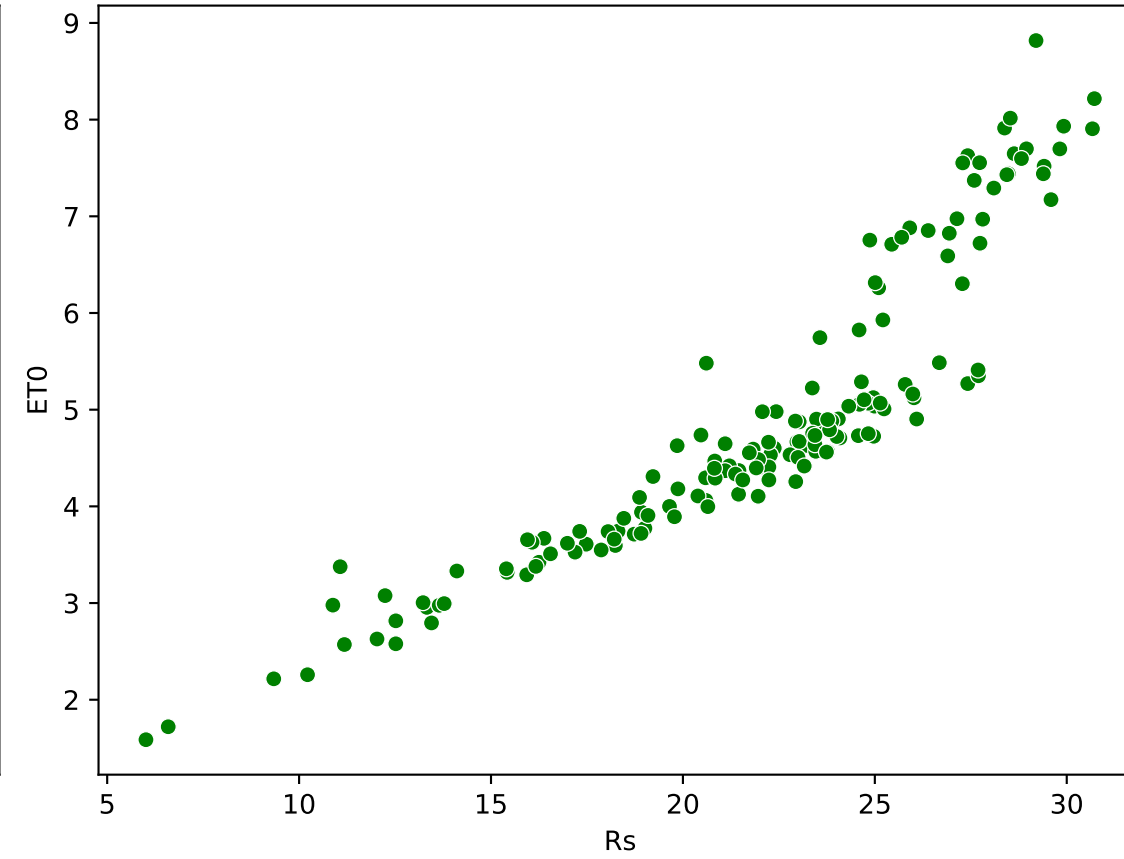


# Dispersión — Zapopan (2011)

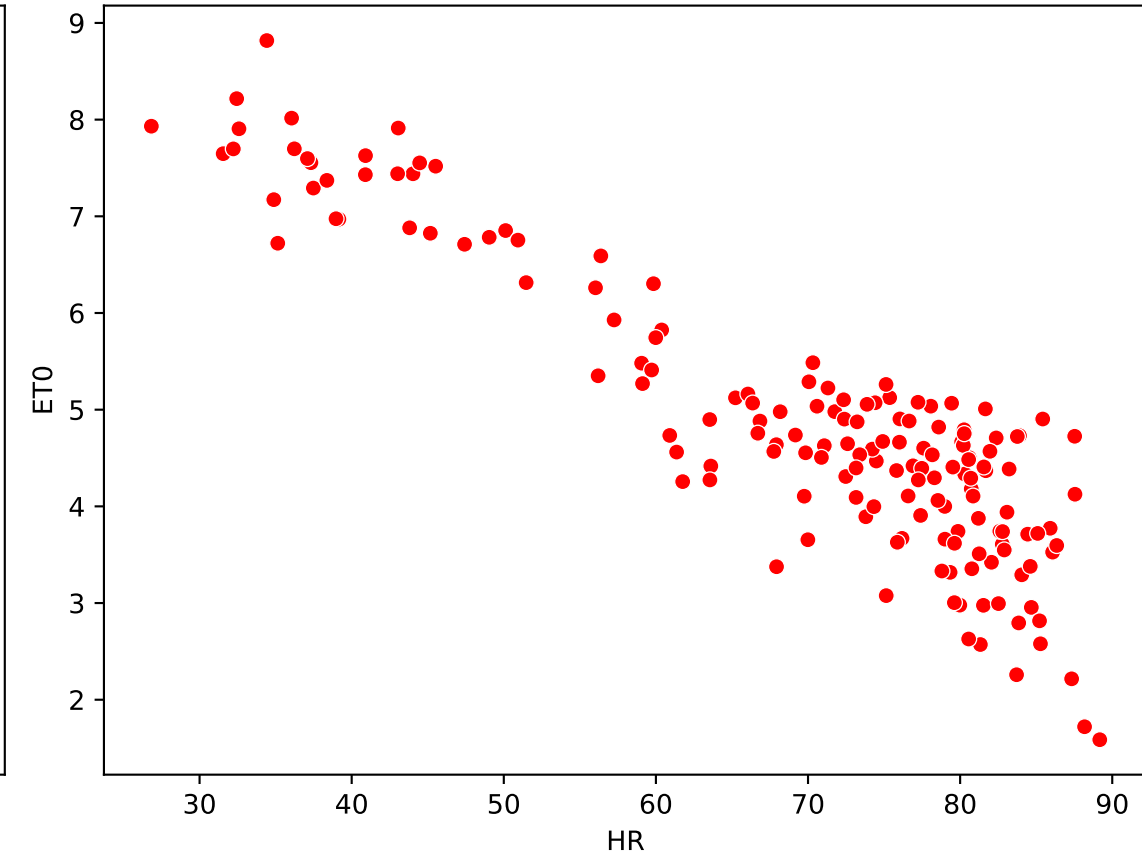
## Tmax vs ET0



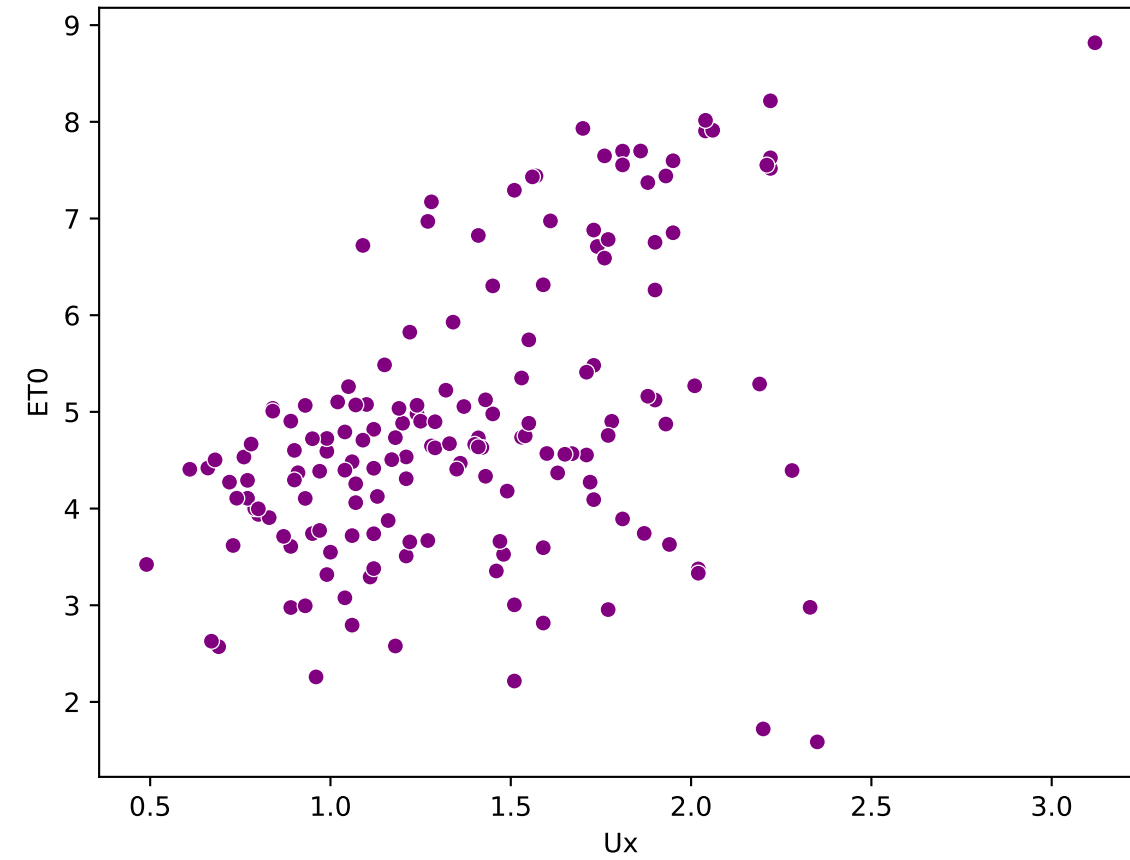
## Rs vs ET0



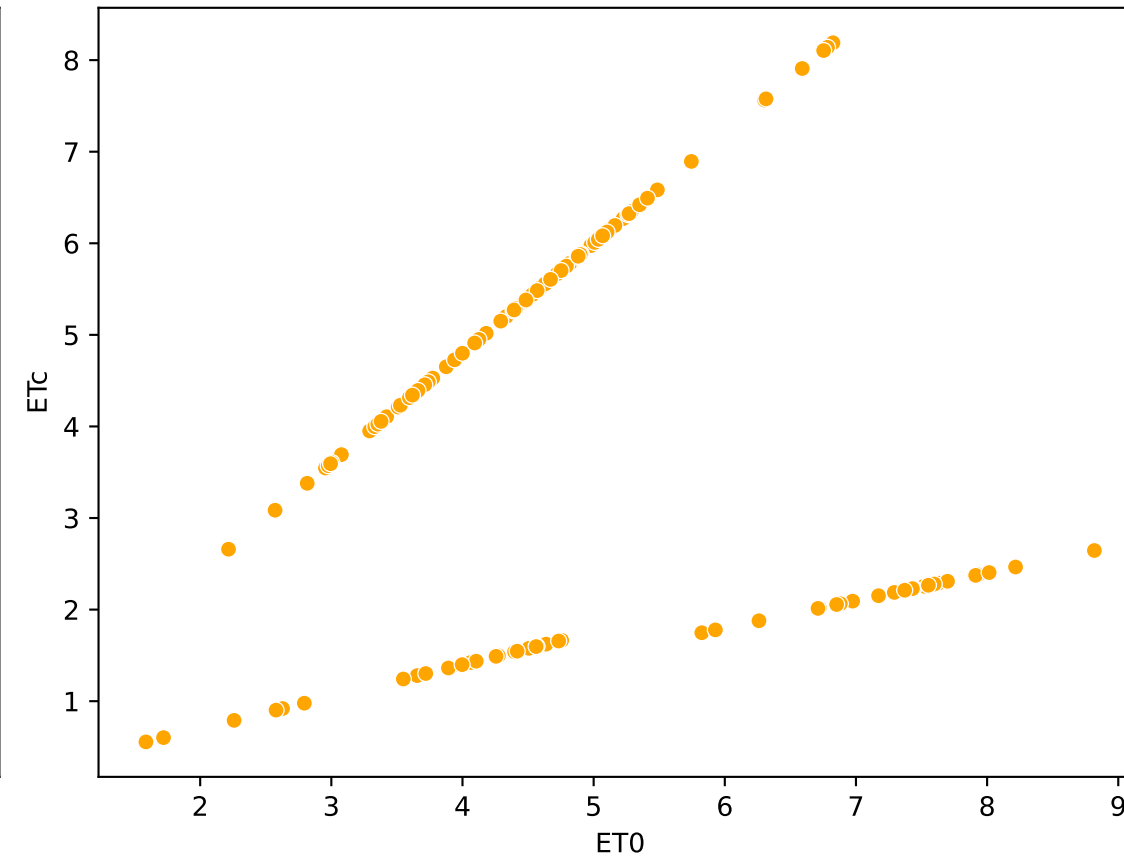
## HR vs ET0



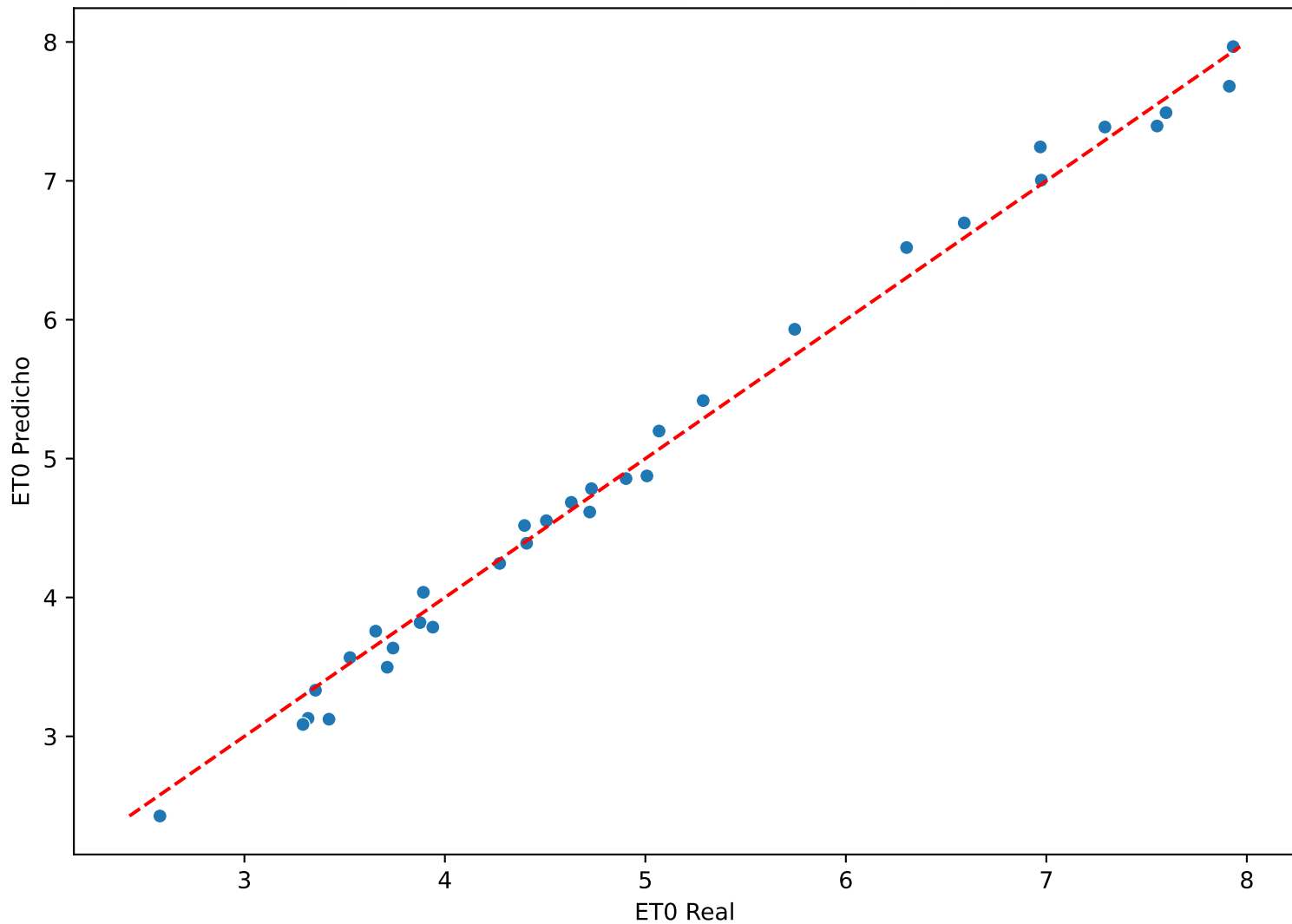
## Ux vs ET0



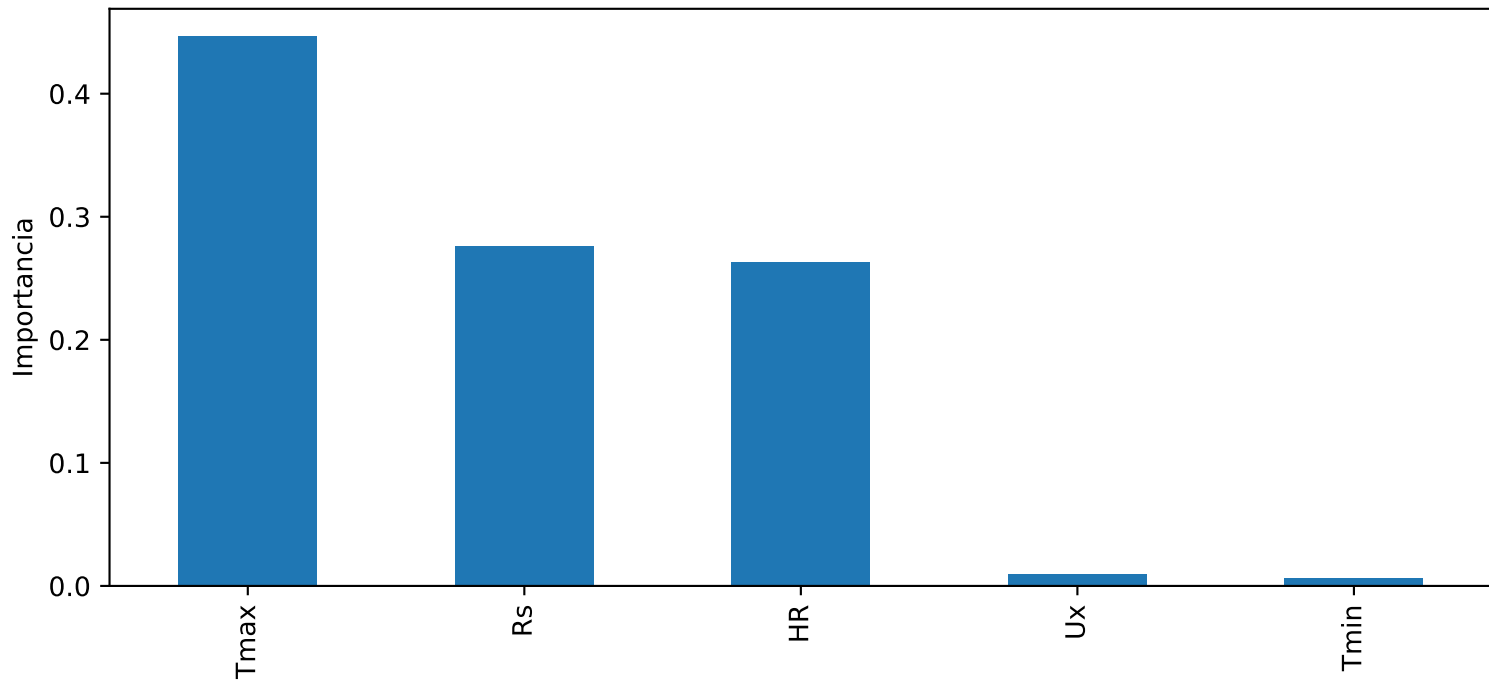
## ET0 vs ETc



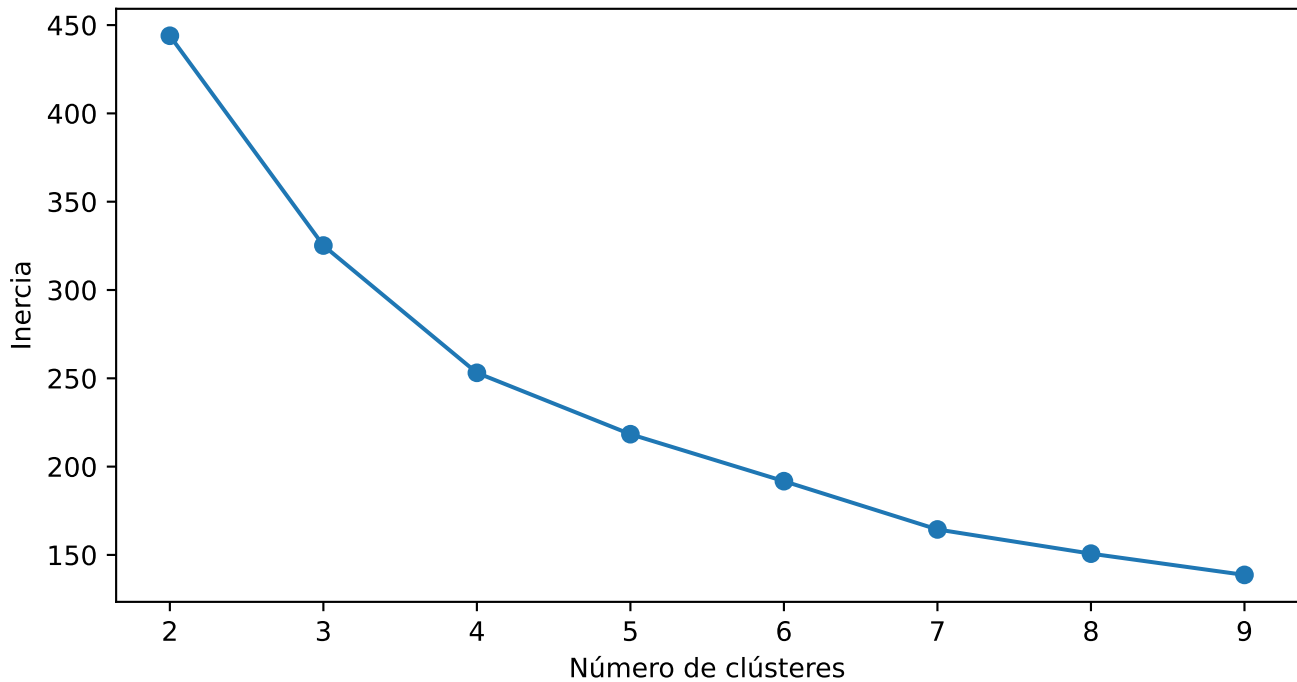
Comparación entre ET0 Real y Predicho — Zapopan (2011)



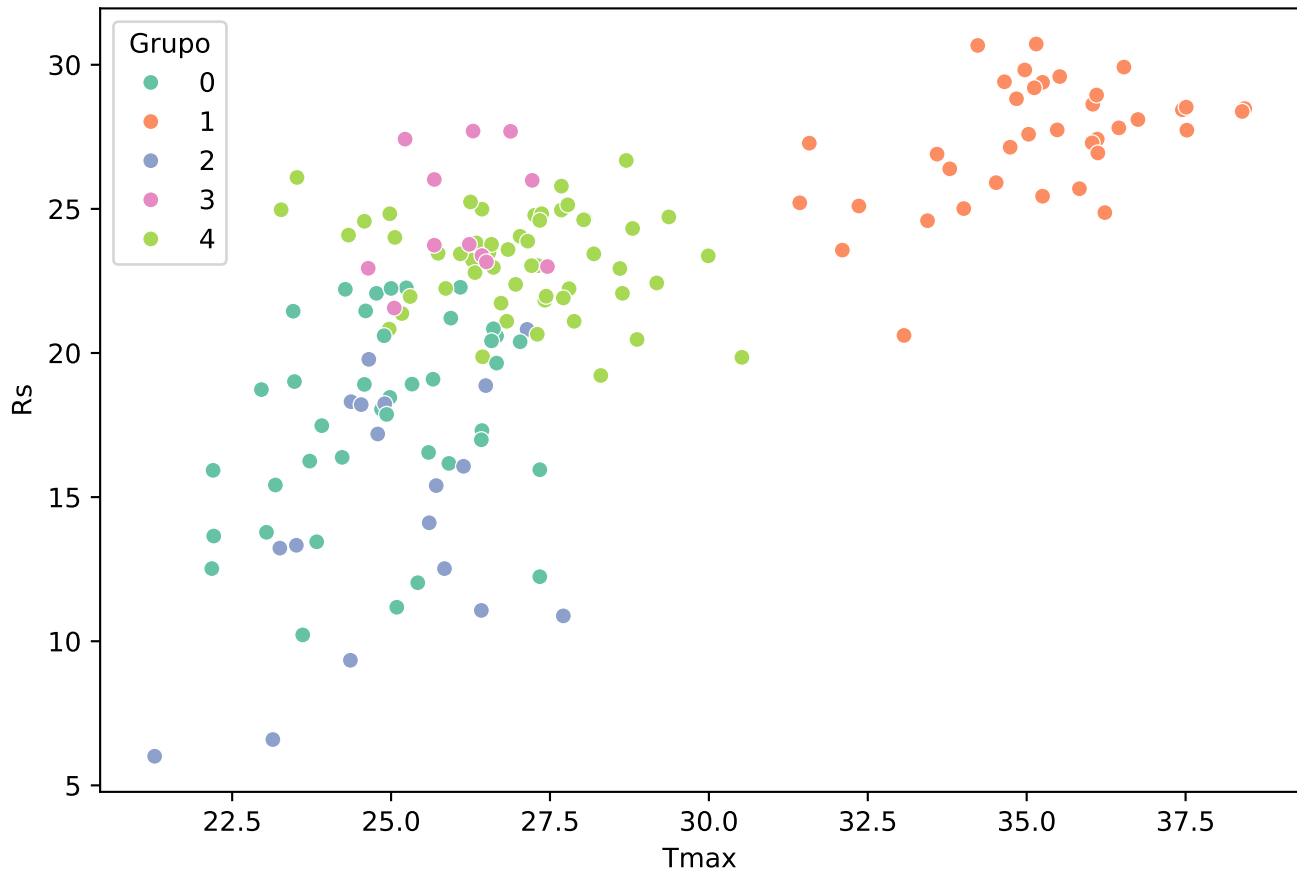
Importancia de variables (RF) — Zapopan (2011)



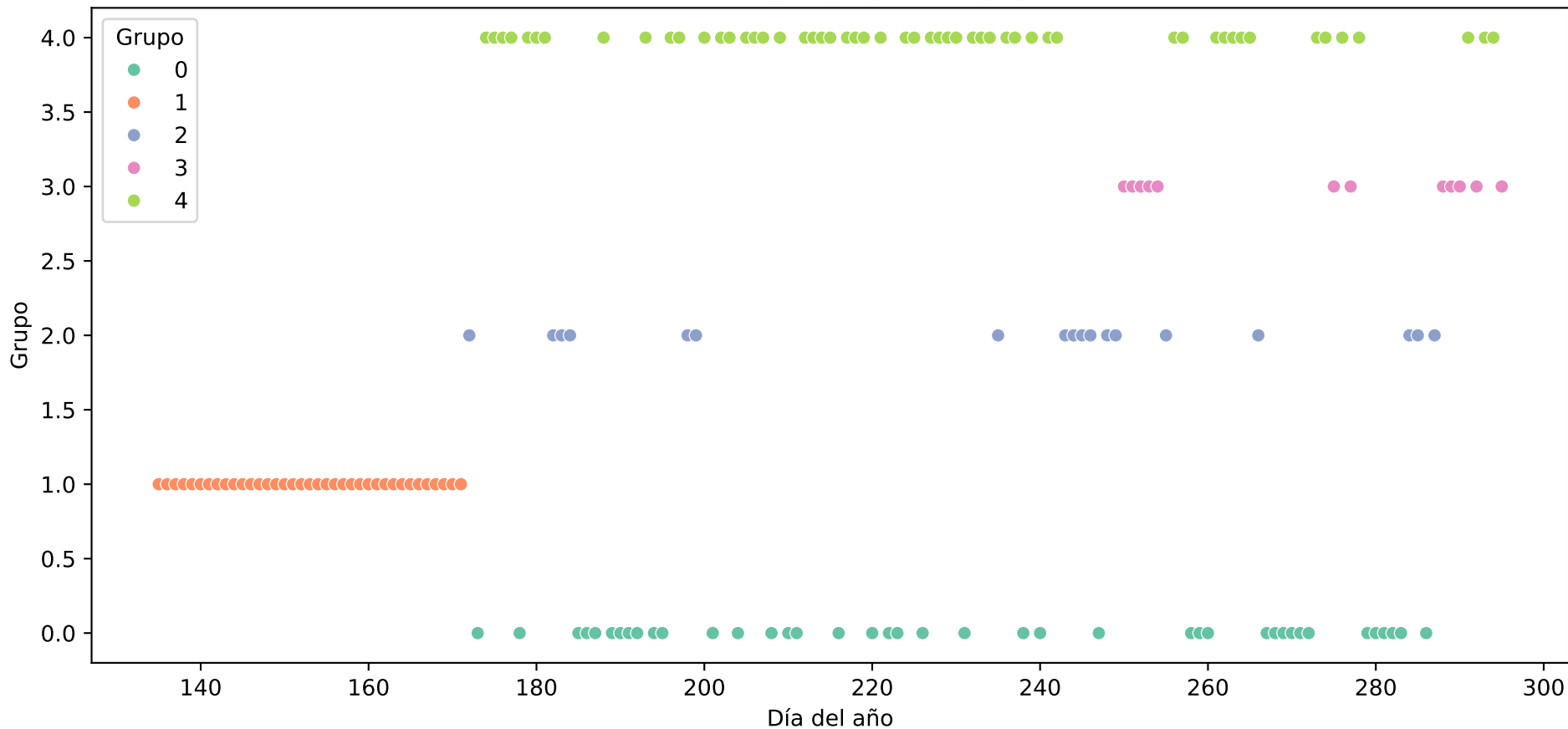
Método del codo



Clasificación de días climáticos — Zapopan (2011)

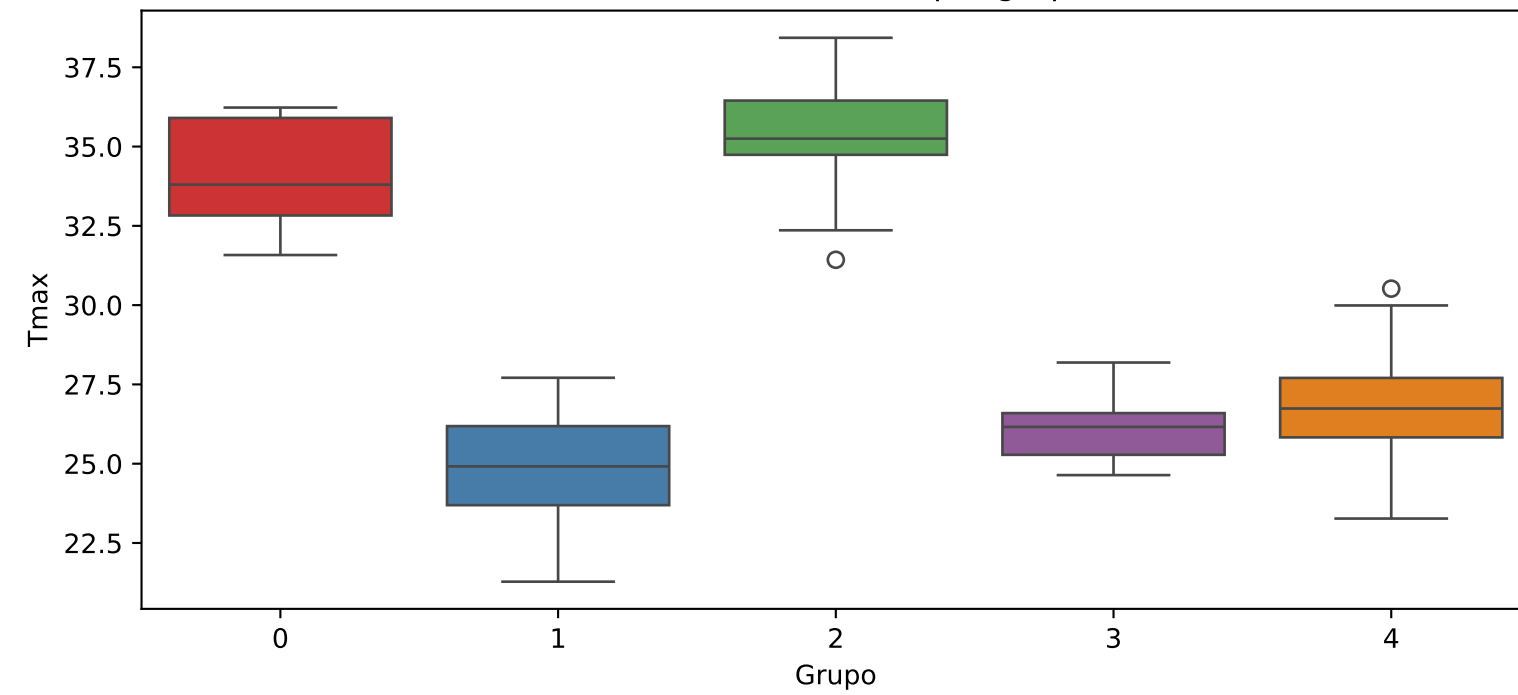


Distribución de días por grupo — Zapopan (2011)

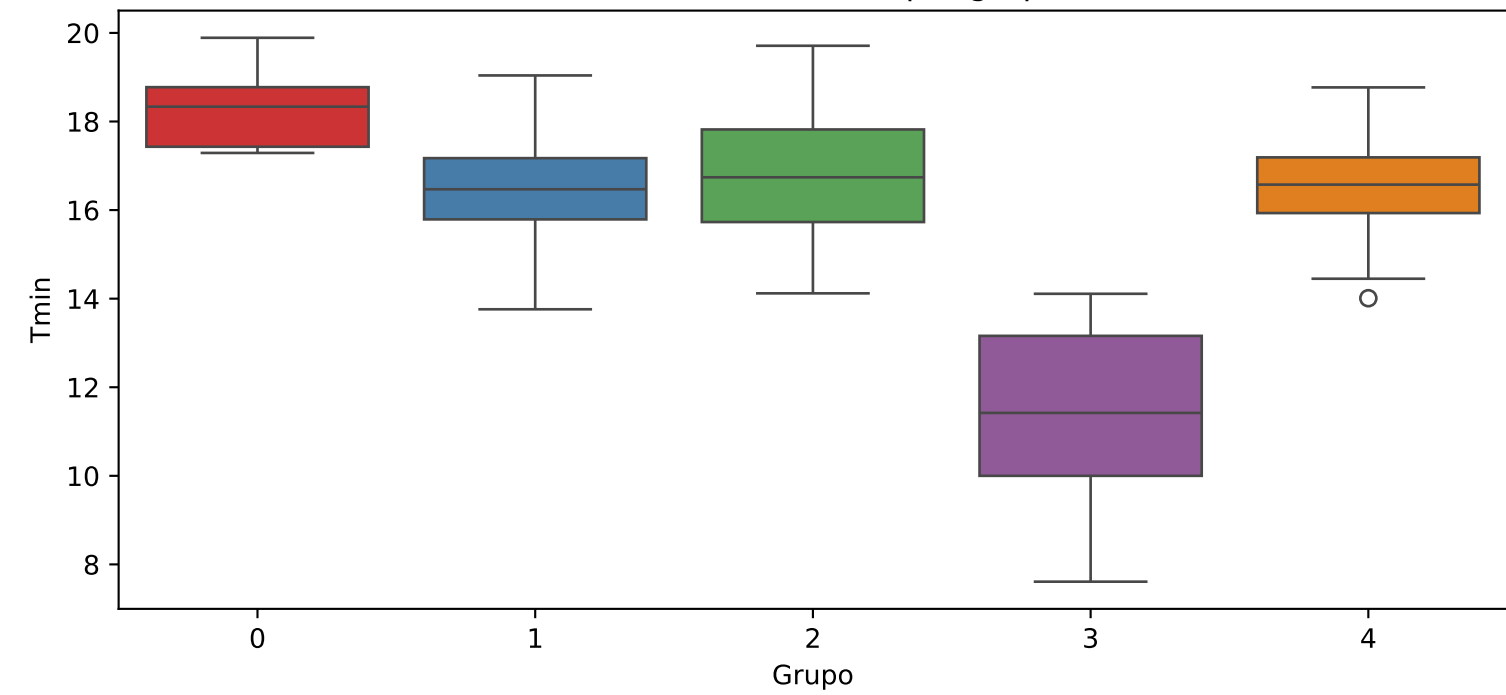


# Boxplots por grupo — Zapopan (2011)

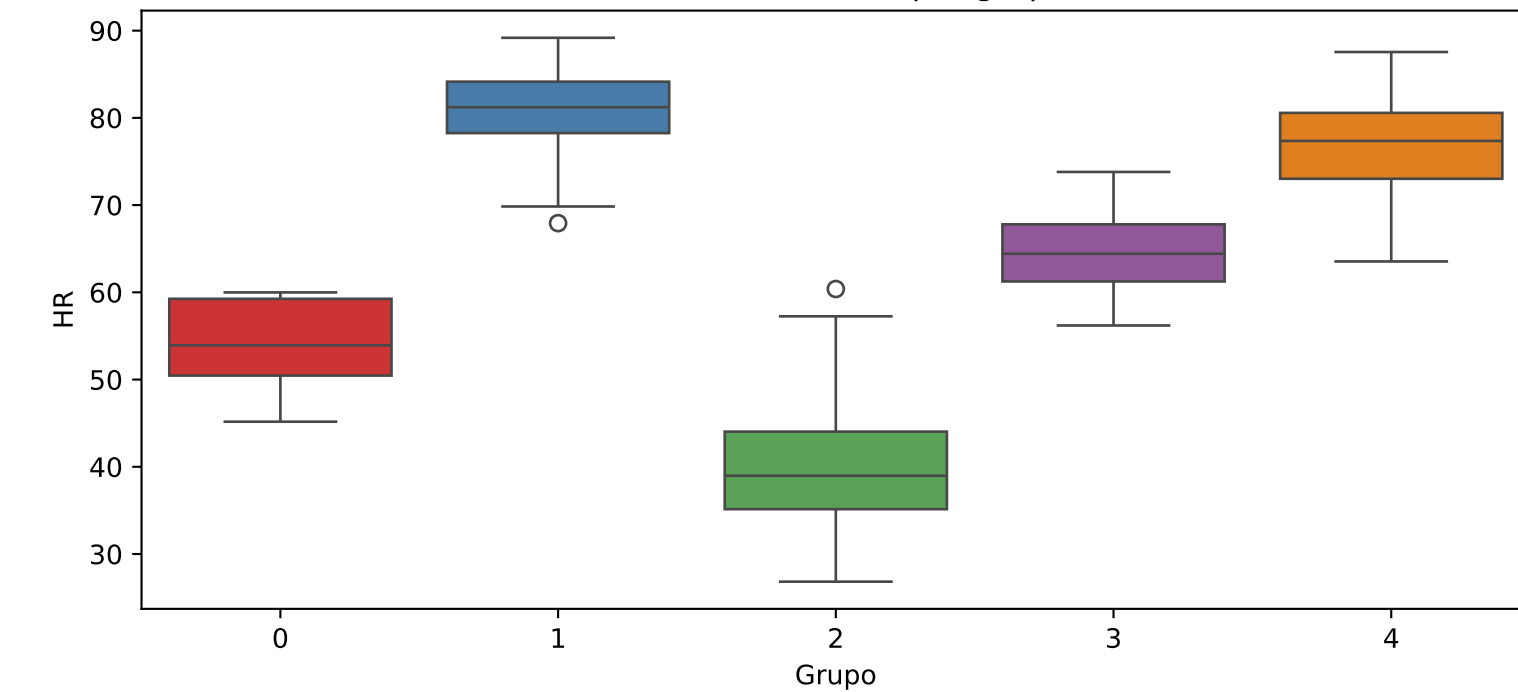
## Distribución de Tmax por grupo



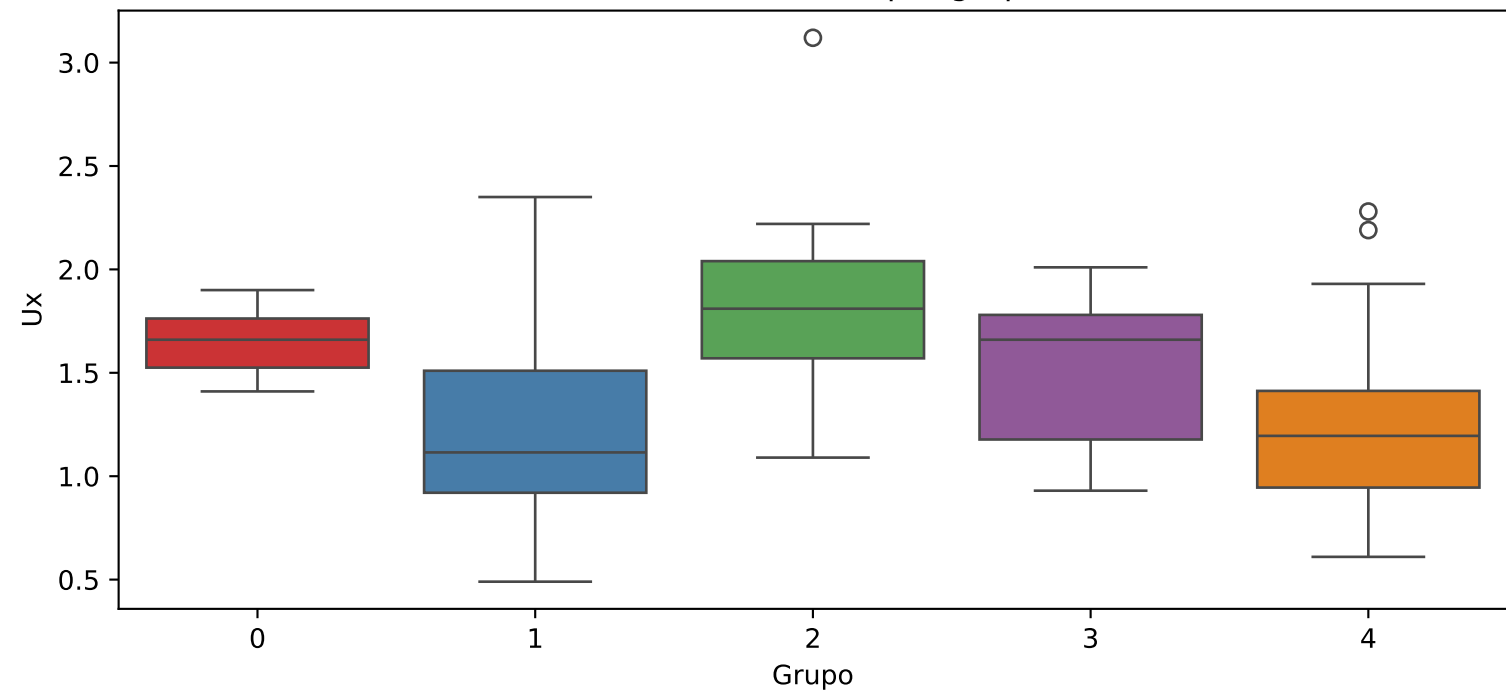
## Distribución de Tmin por grupo



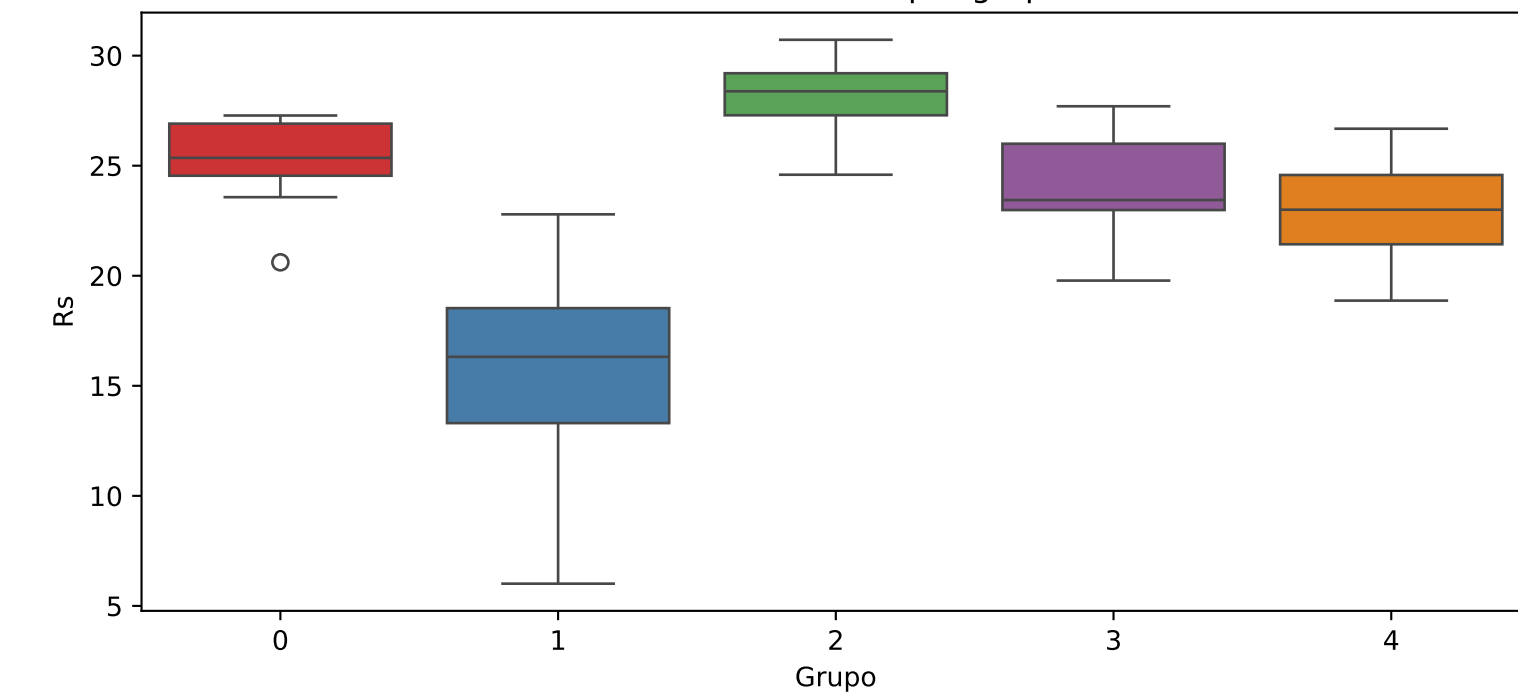
## Distribución de HR por grupo



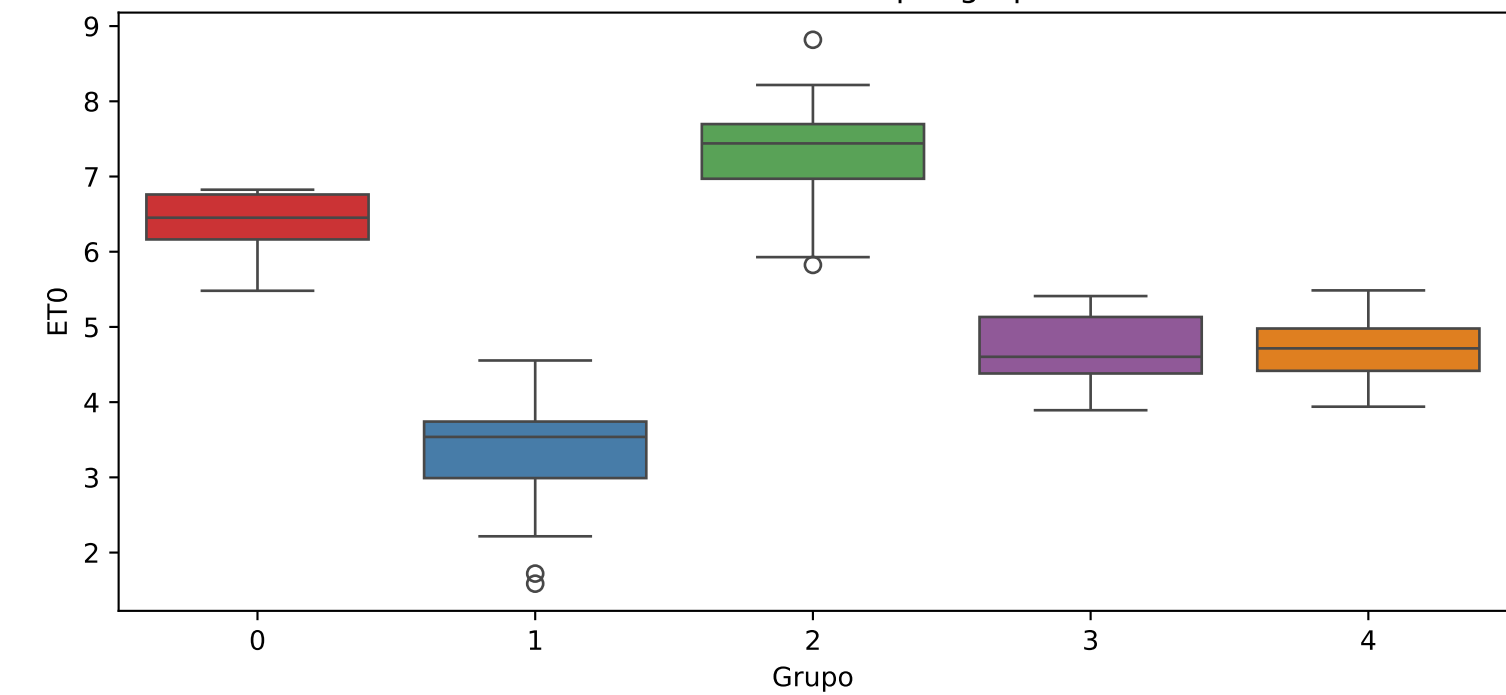
## Distribución de Ux por grupo



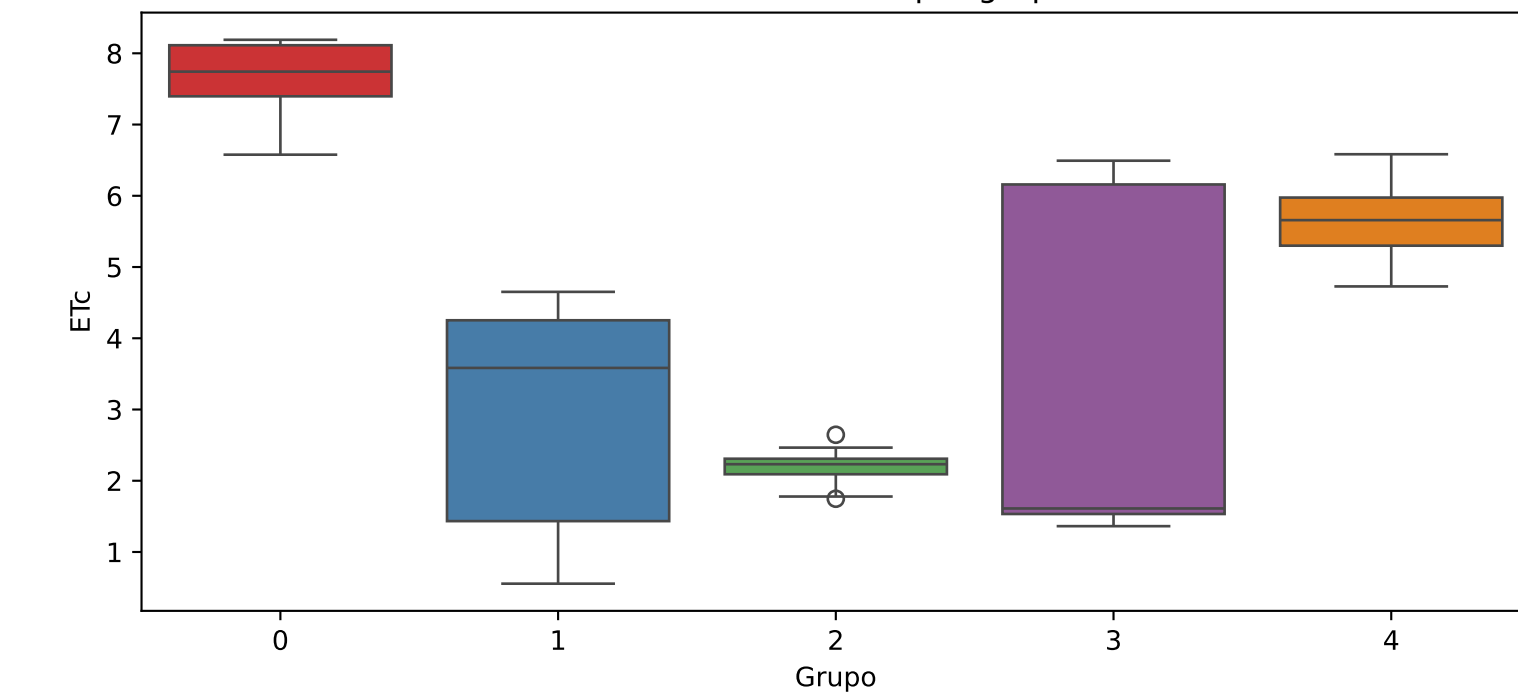
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

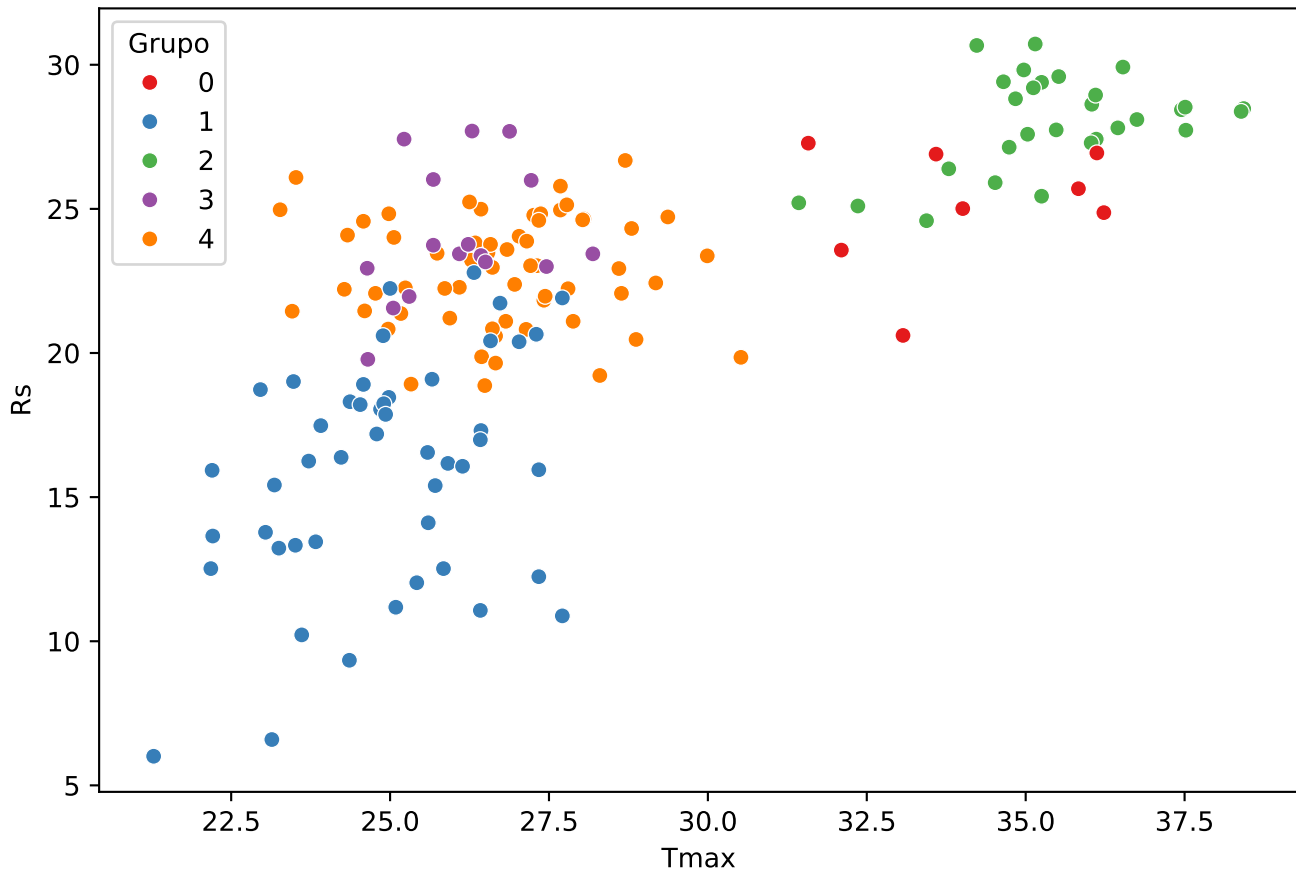


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2011)



## **Zapopan — 2012**

Días del ciclo: 161

ETc total [mm]: 645.0

ETverde total [mm]: 346.3

ETazul total [mm]: 298.7

Tmax / Tmin [°C]: 37.4 / 7.9

## Zapopan — 2012 · Resultados y métricas

[Zapopan 2012] Regresión Lineal ET0 —  $R^2$ : 0.9890 MSE: 0.0163

[Zapopan 2012] Random Forest ET0 —  $R^2$ : 0.9803 MSE: 0.0292

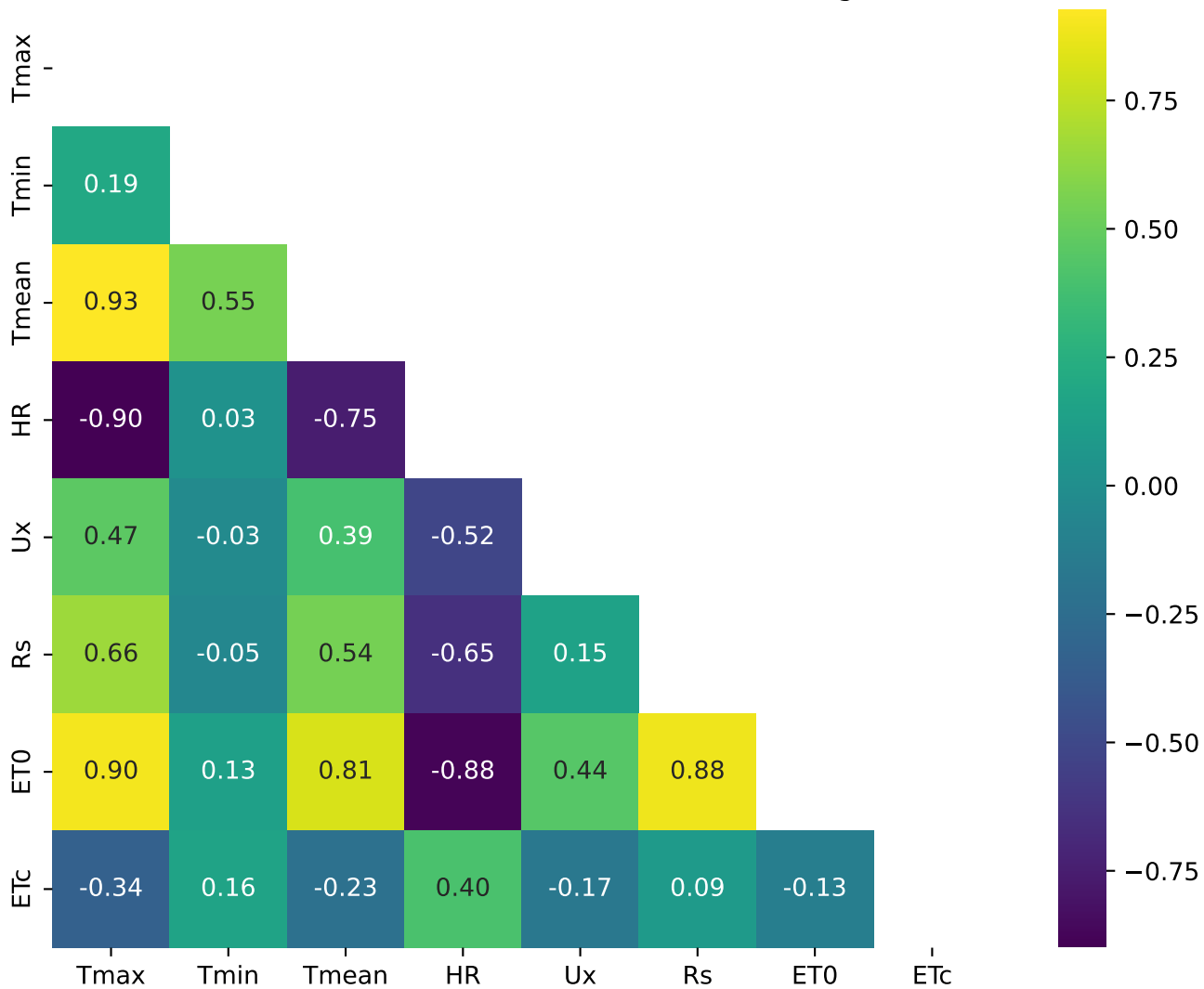
Importancias: {'Tmax': 0.5904292936041503, 'Tmin': 0.004565871378758187, 'HR': 0.16029618328700815, 'Ux': 0.012164647225032342, 'Rs': 0.232544004505051}

Estadísticas descriptivas por grupo (medias):

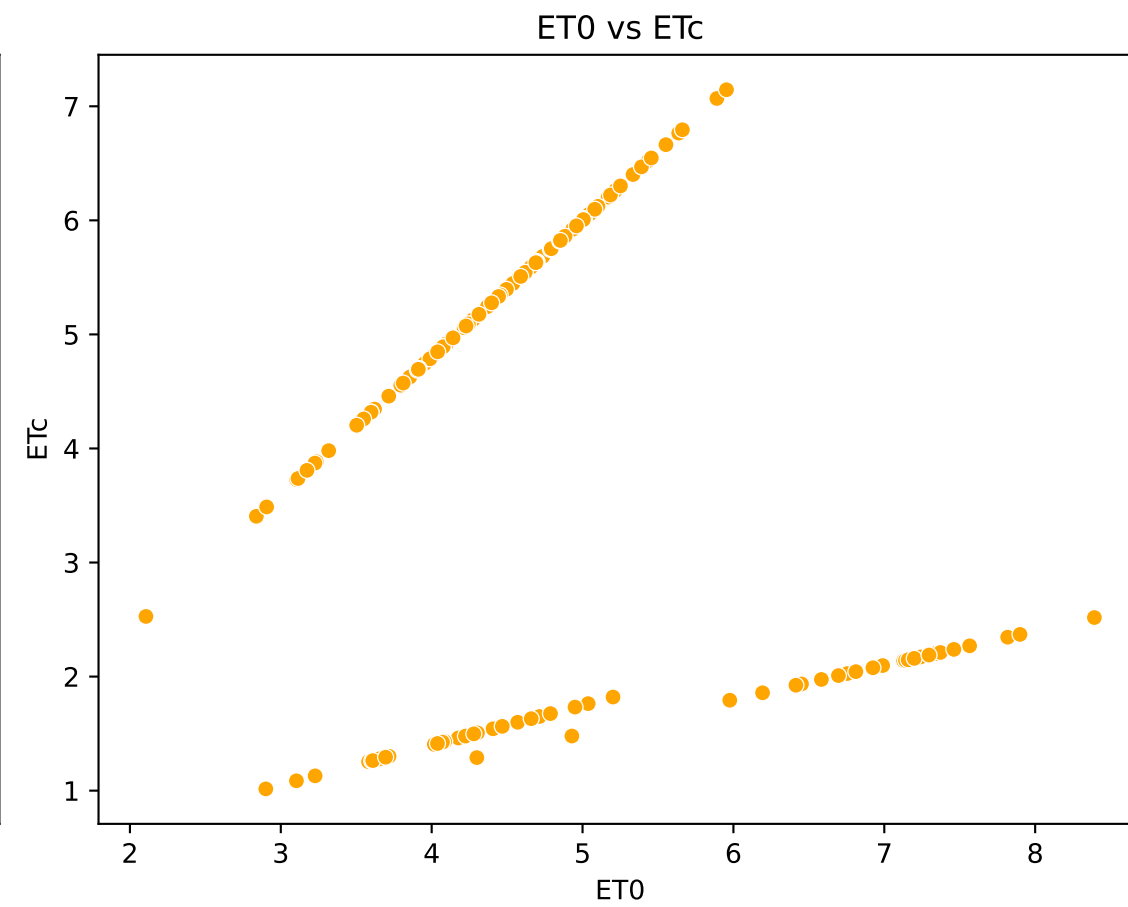
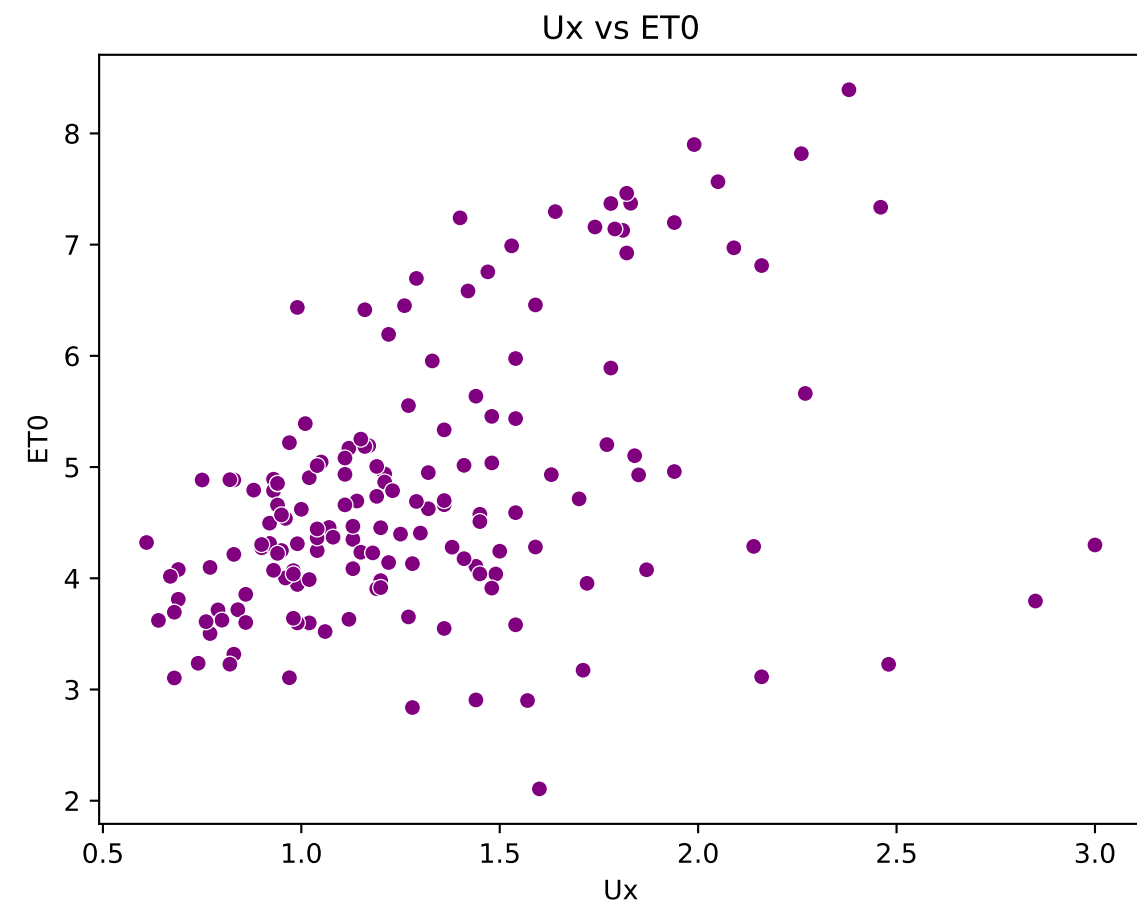
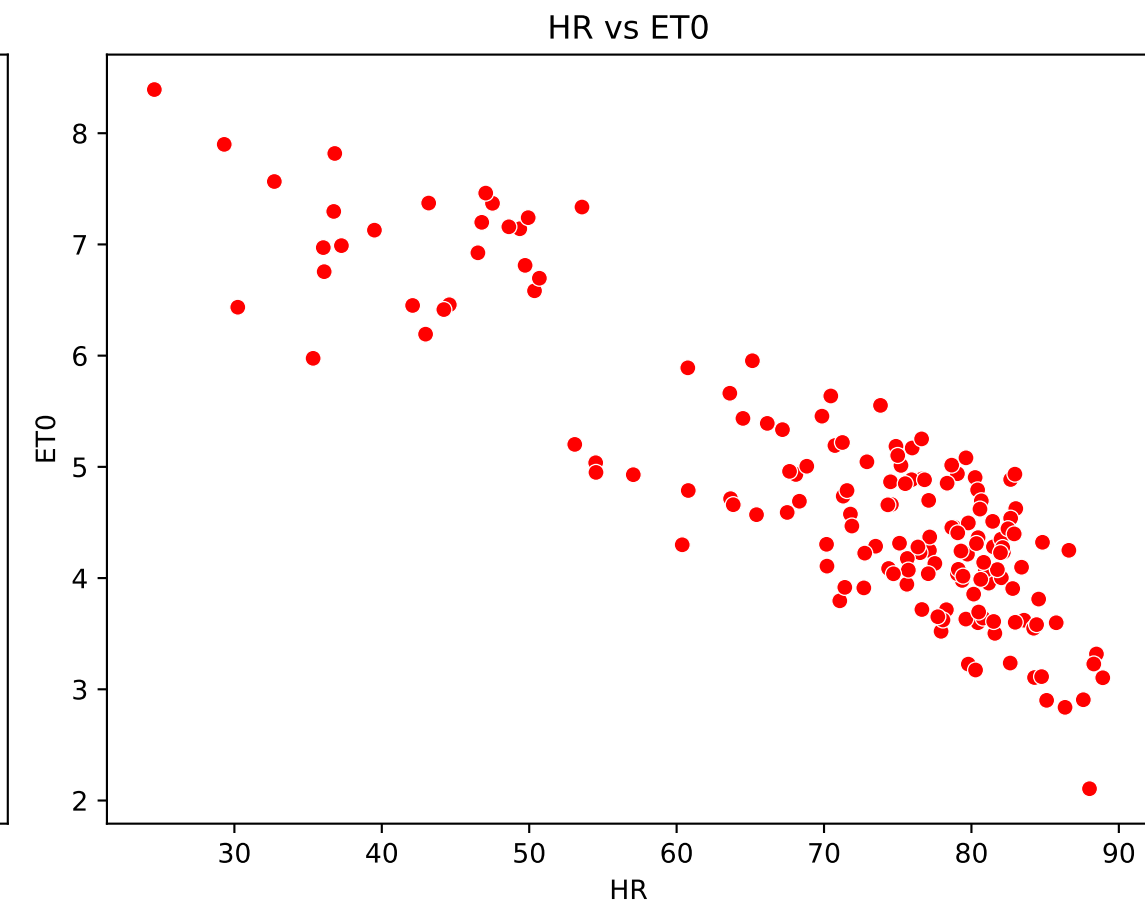
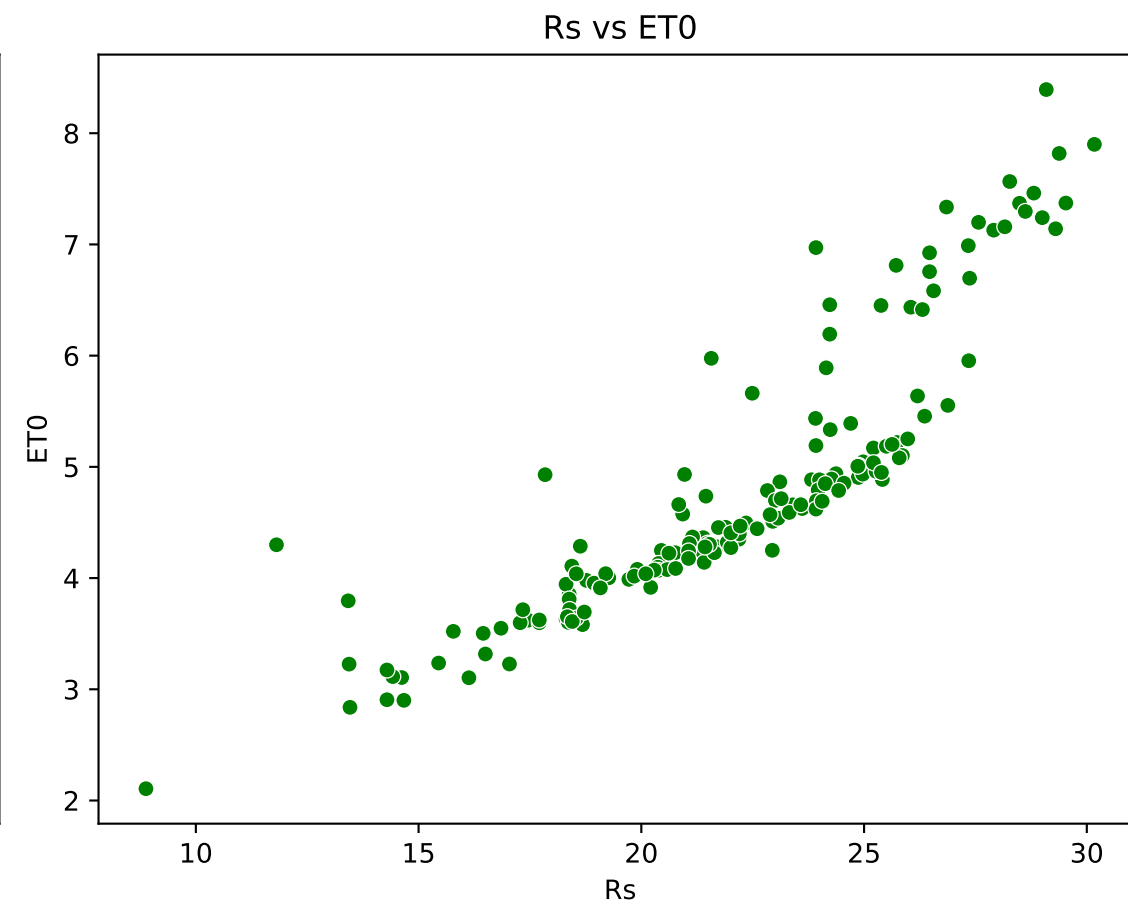
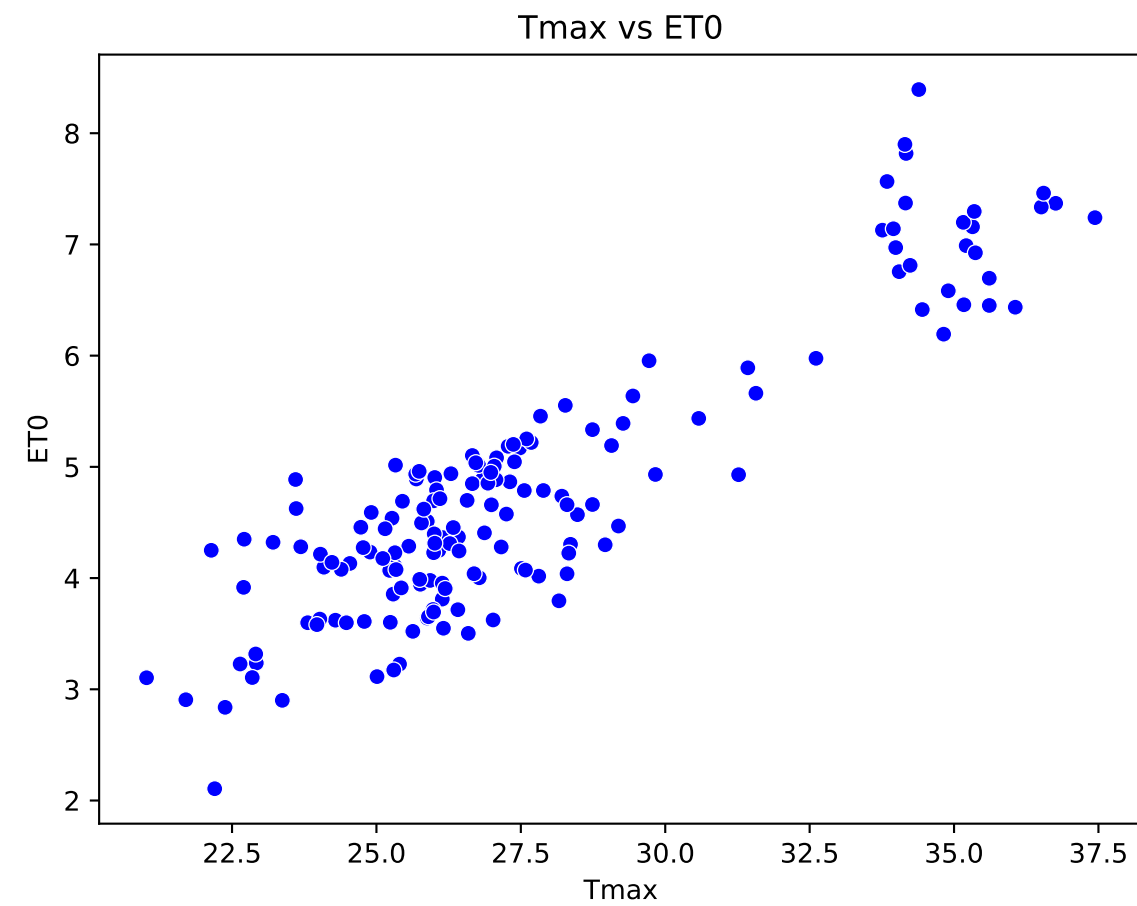
	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	27.990000	16.957143	70.024286	2.392857	16.007143	4.187623	3.838570
1	25.160208	16.244375	80.733125	1.070417	17.977917	3.682883	3.158629
2	34.948148	16.895926	41.916296	1.719630	27.139630	7.038425	2.111527
3	27.152308	11.908462	64.626154	1.360000	23.266154	4.633822	2.502007
4	26.456970	16.290606	76.603939	1.166970	23.324697	4.760182	5.712218

**Zapopan — 2012**

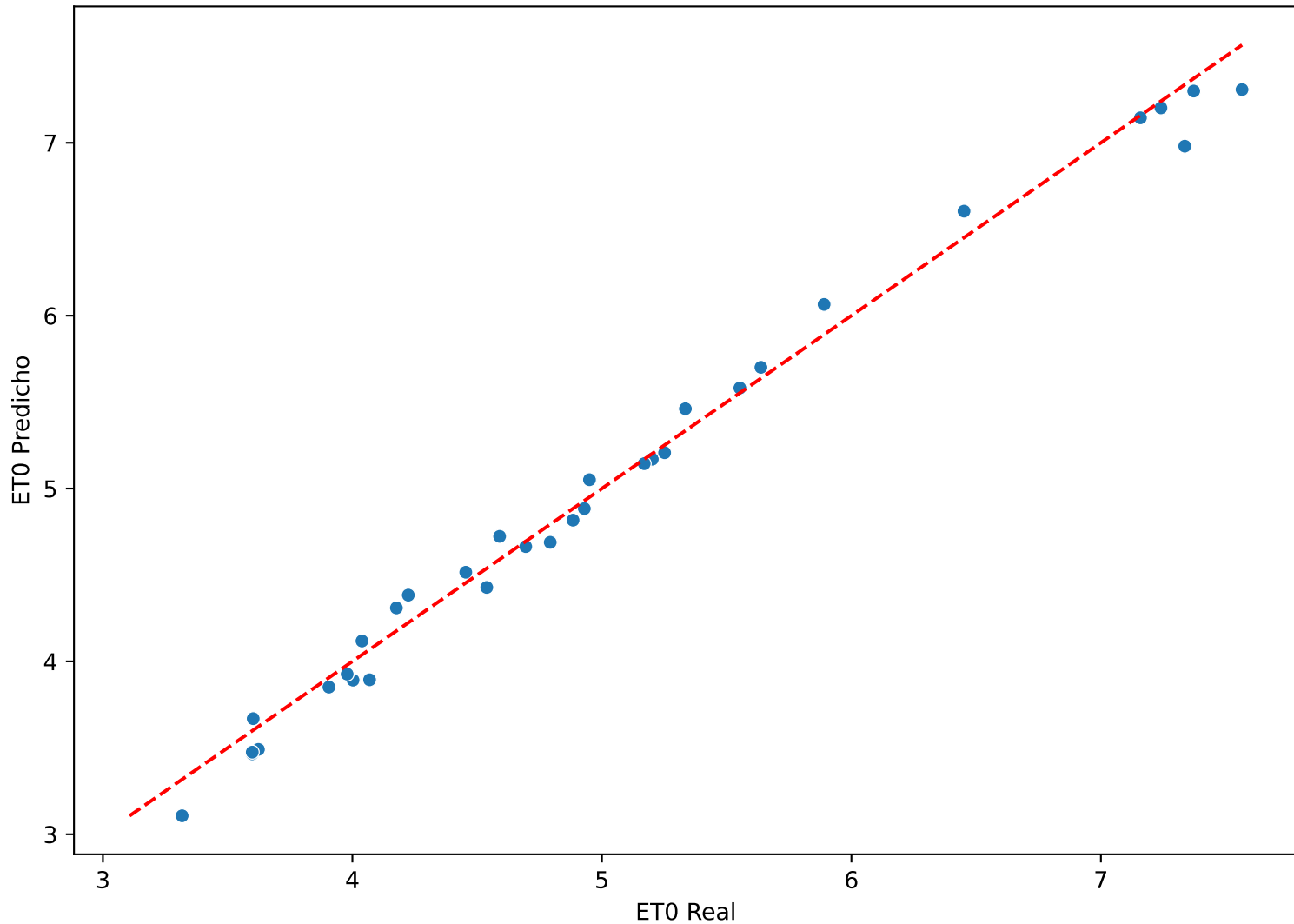
Matriz de Correlación entre Variables Meteorológicas



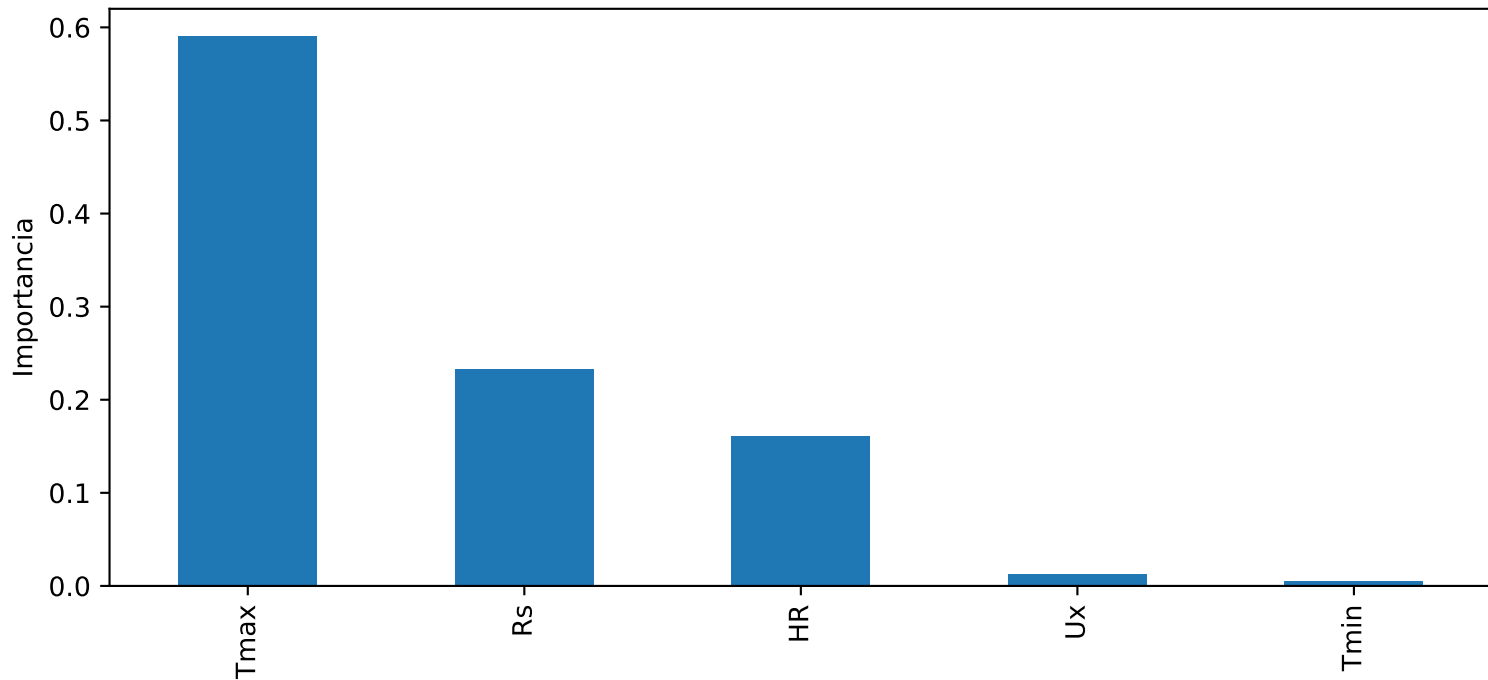
Dispersión — Zapopan (2012)



Comparación entre ET0 Real y Predicho — Zapopan (2012)

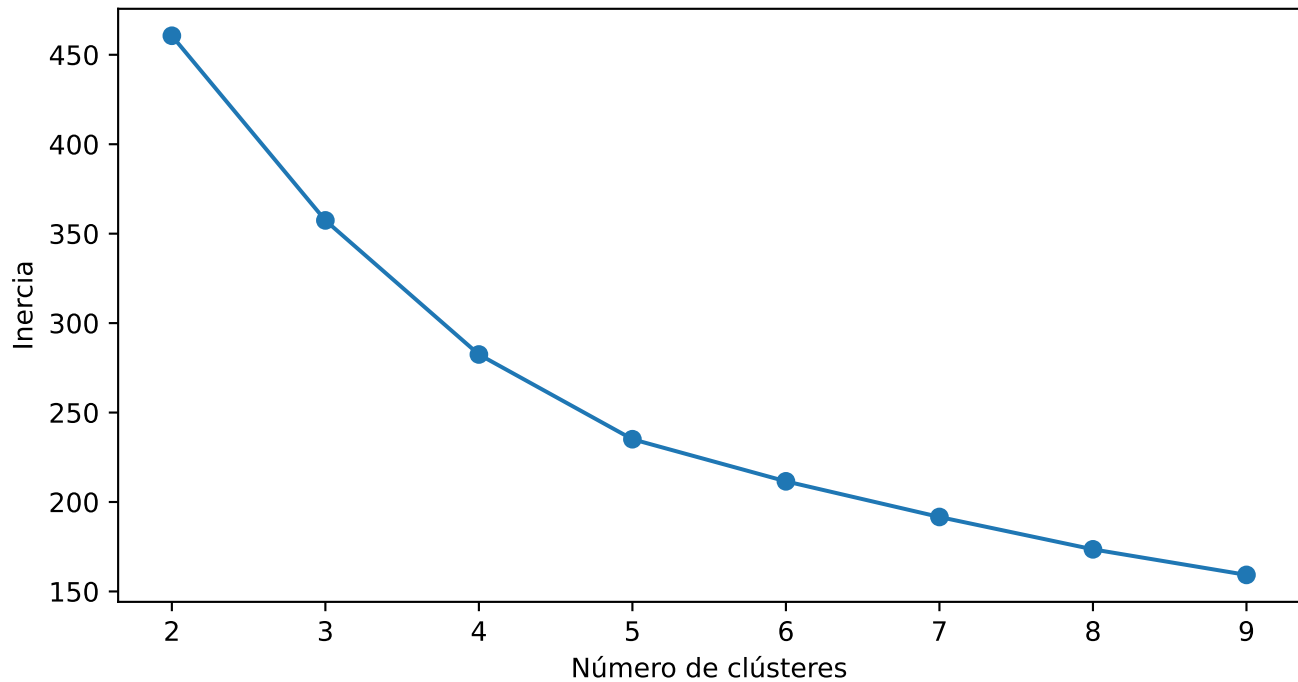


Importancia de variables (RF) — Zapopan (2012)

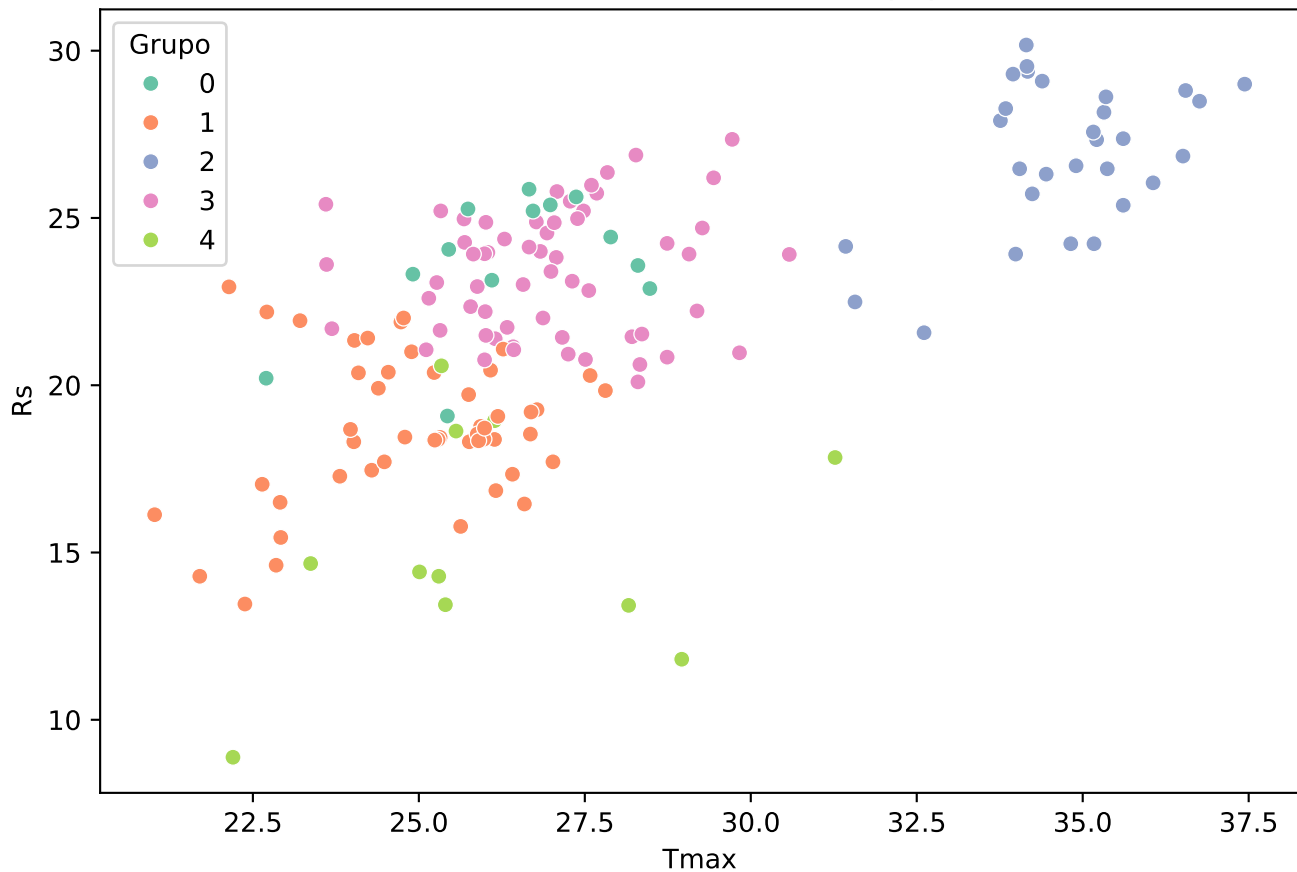




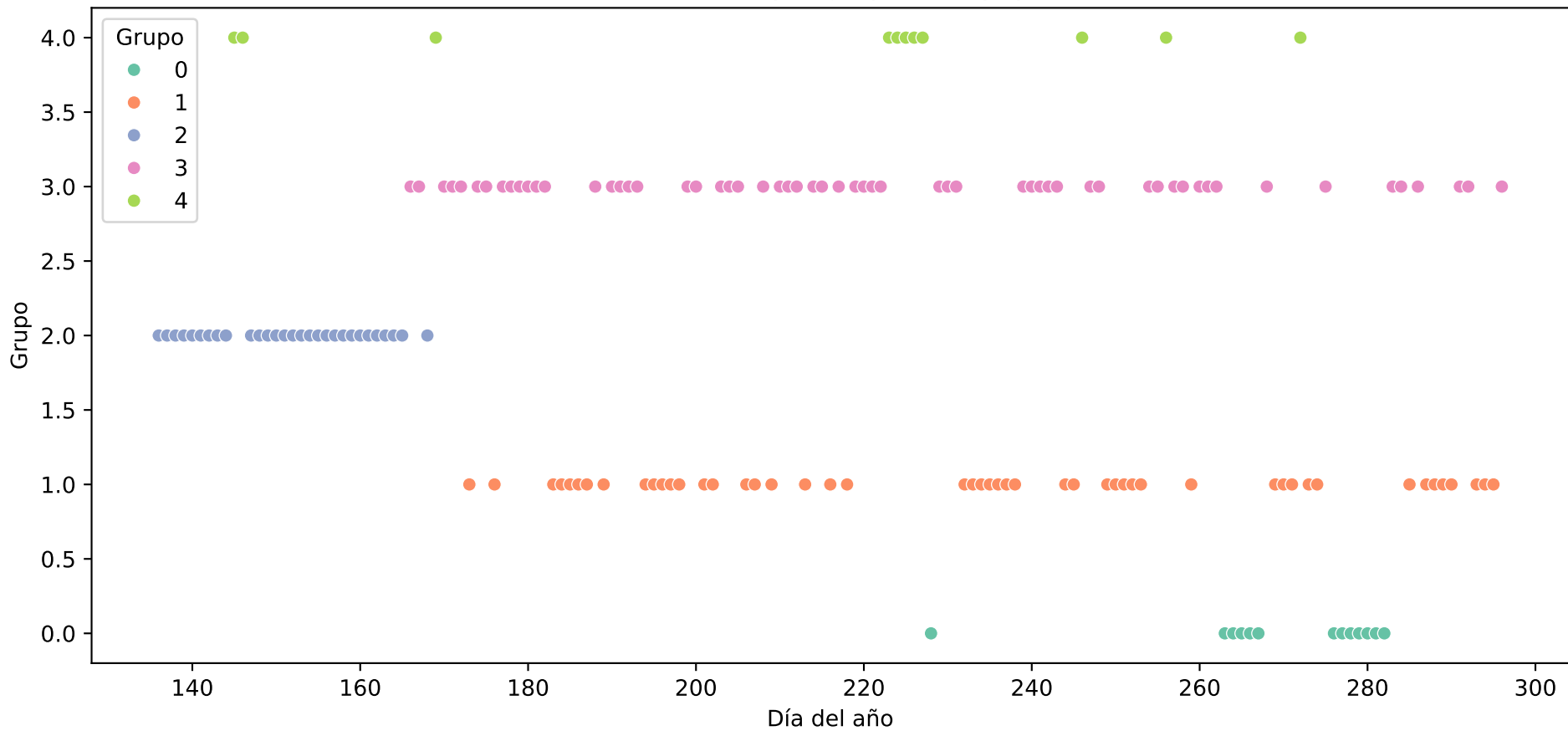
Método del codo



Clasificación de días climáticos — Zapopan (2012)

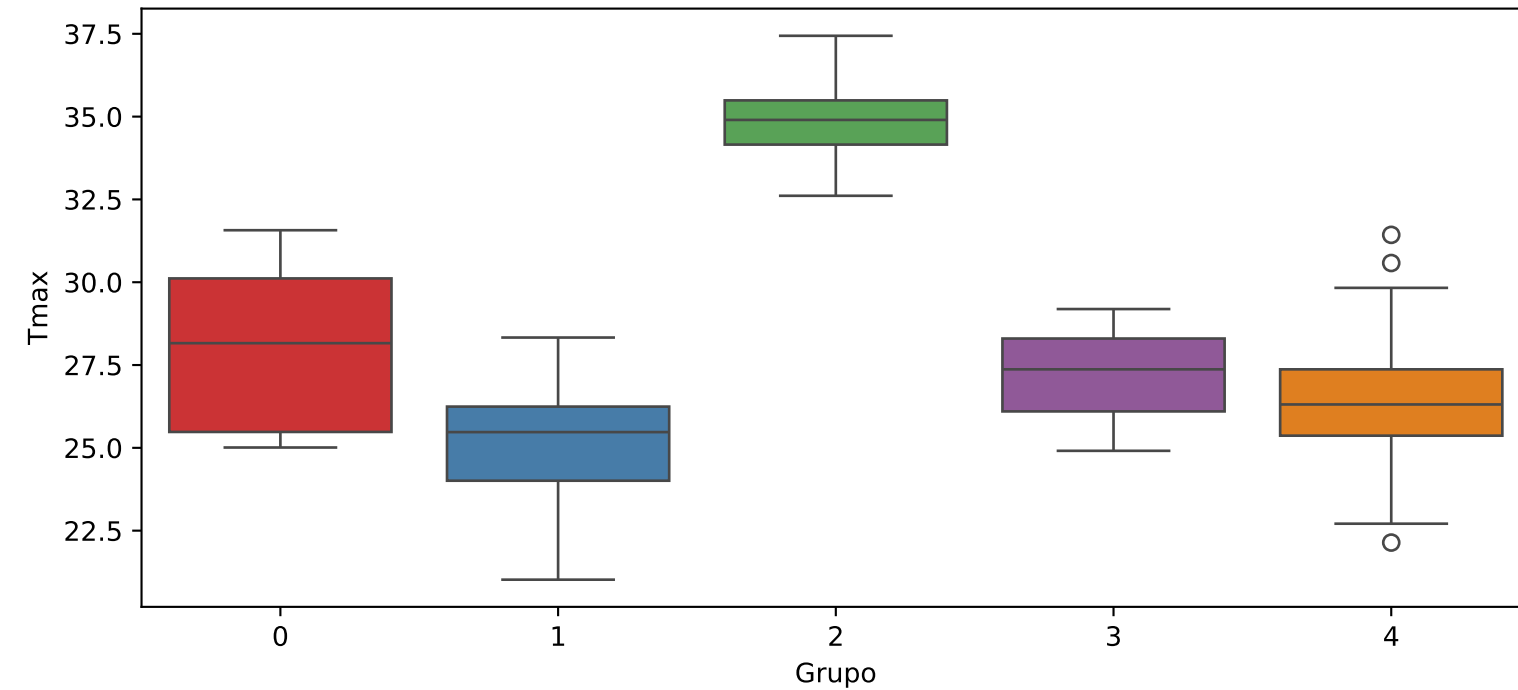


Distribución de días por grupo — Zapopan (2012)

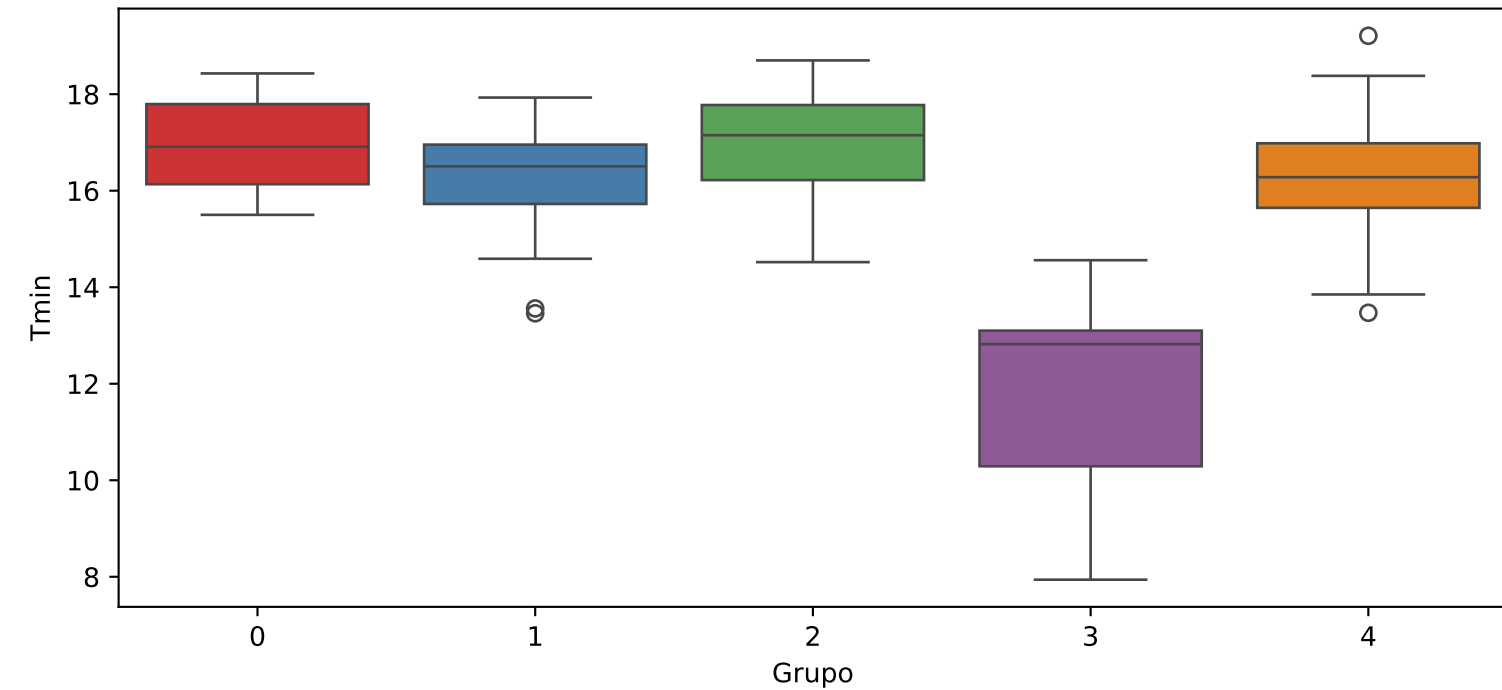


# Boxplots por grupo — Zapopan (2012)

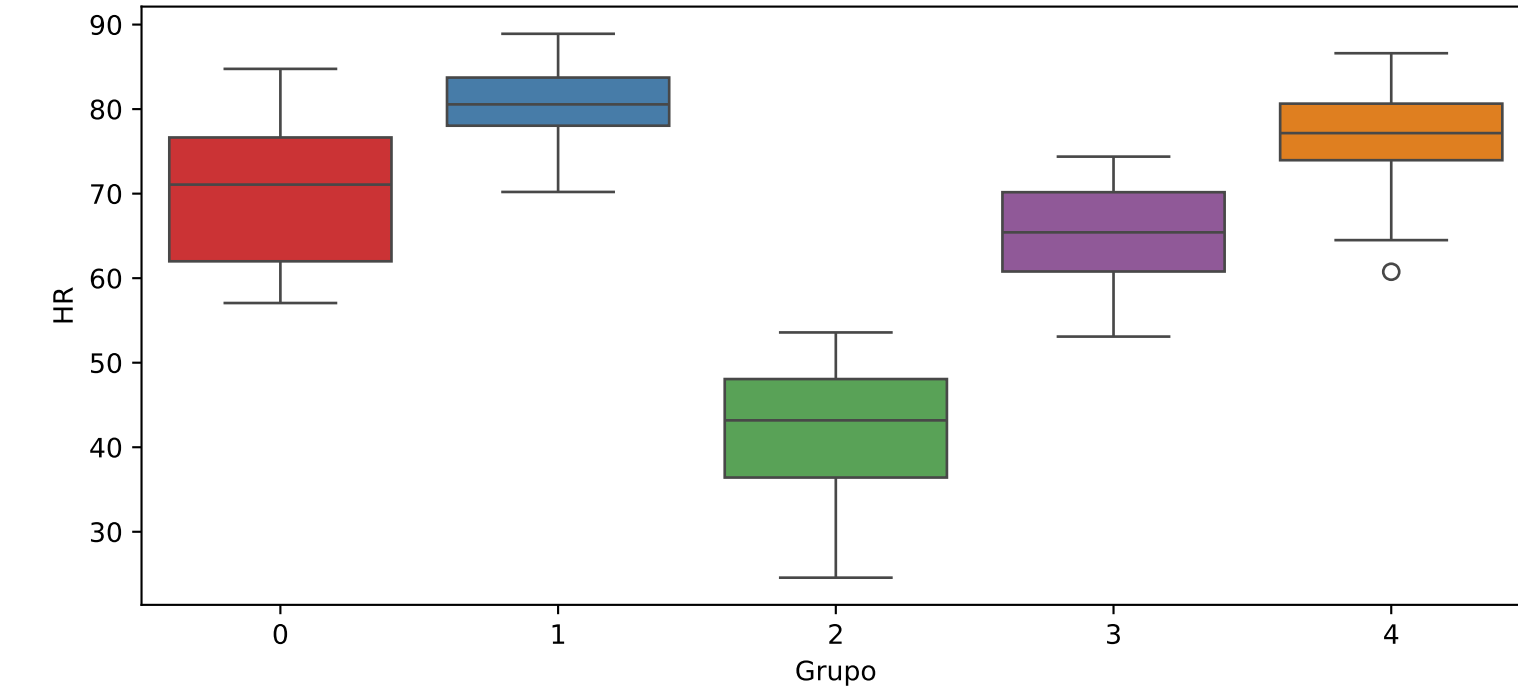
## Distribución de Tmax por grupo



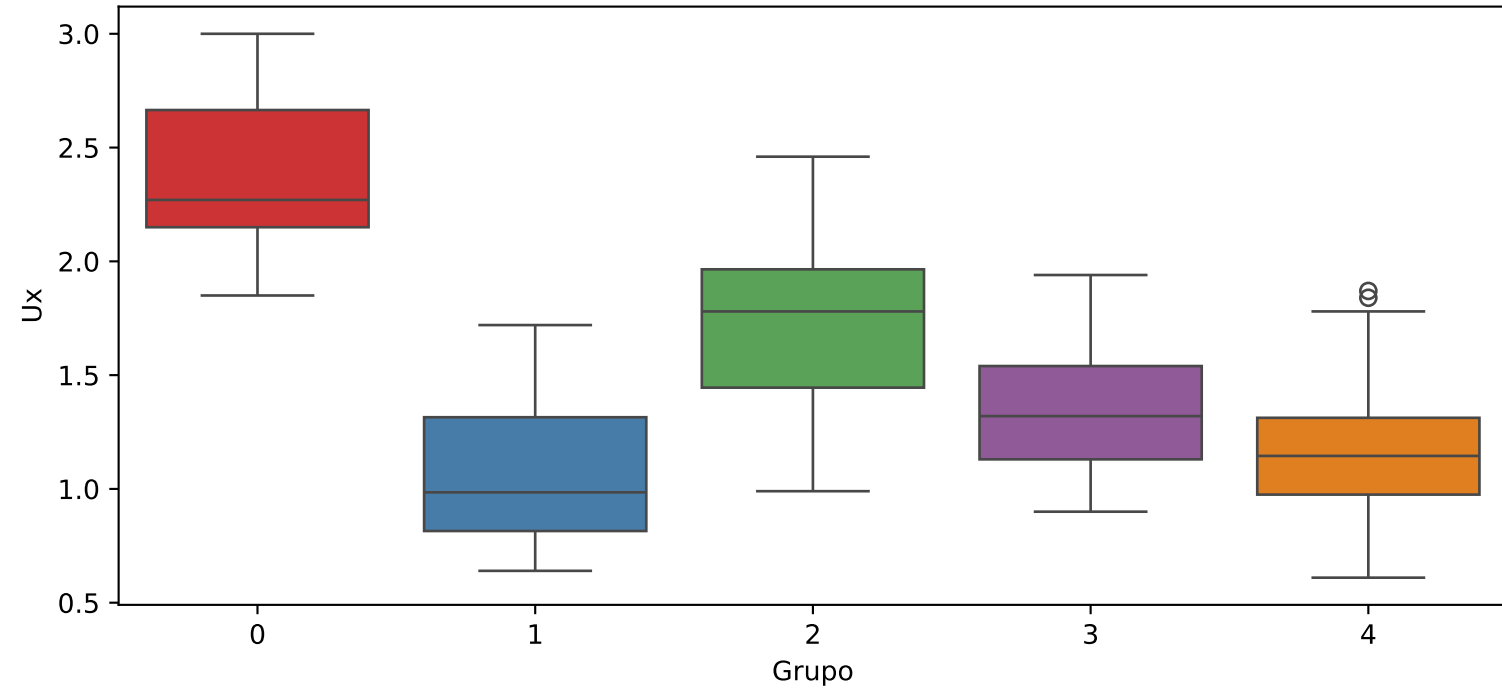
## Distribución de Tmin por grupo



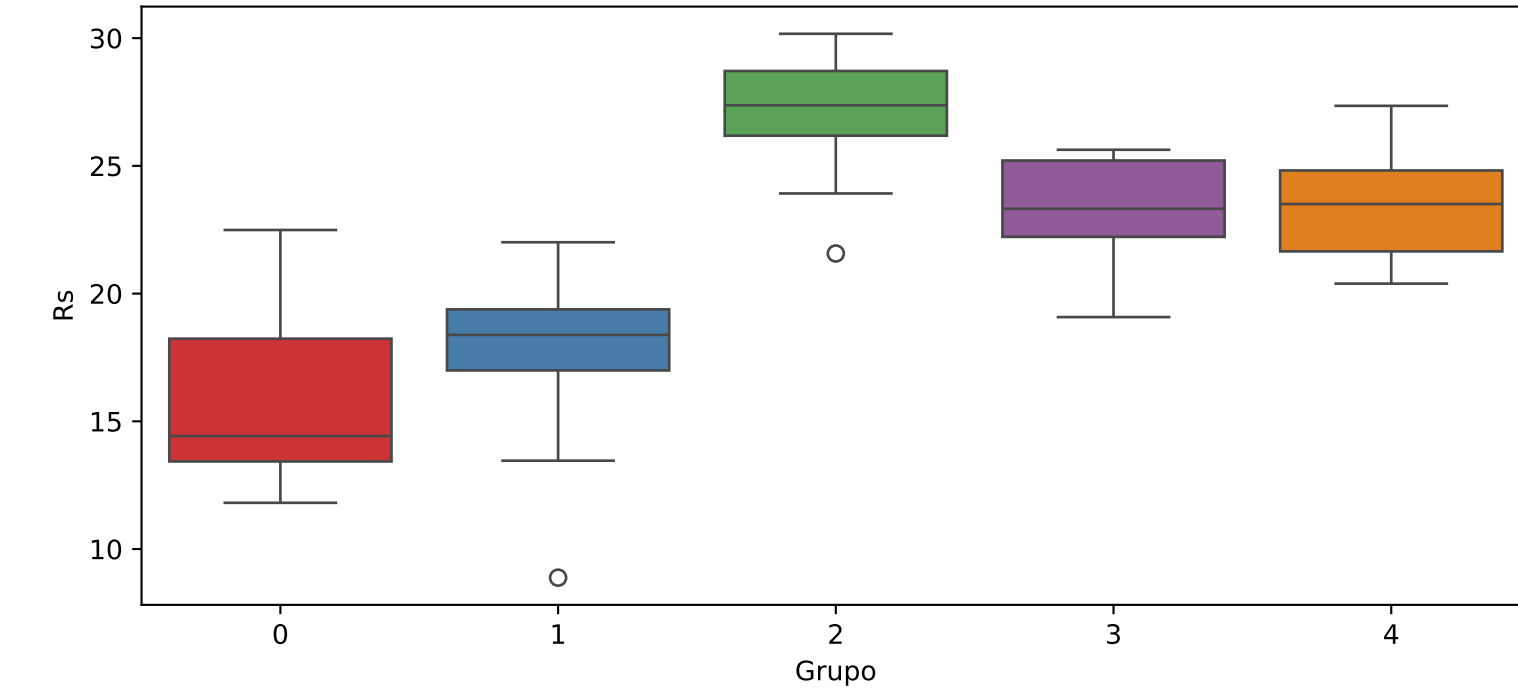
## Distribución de HR por grupo



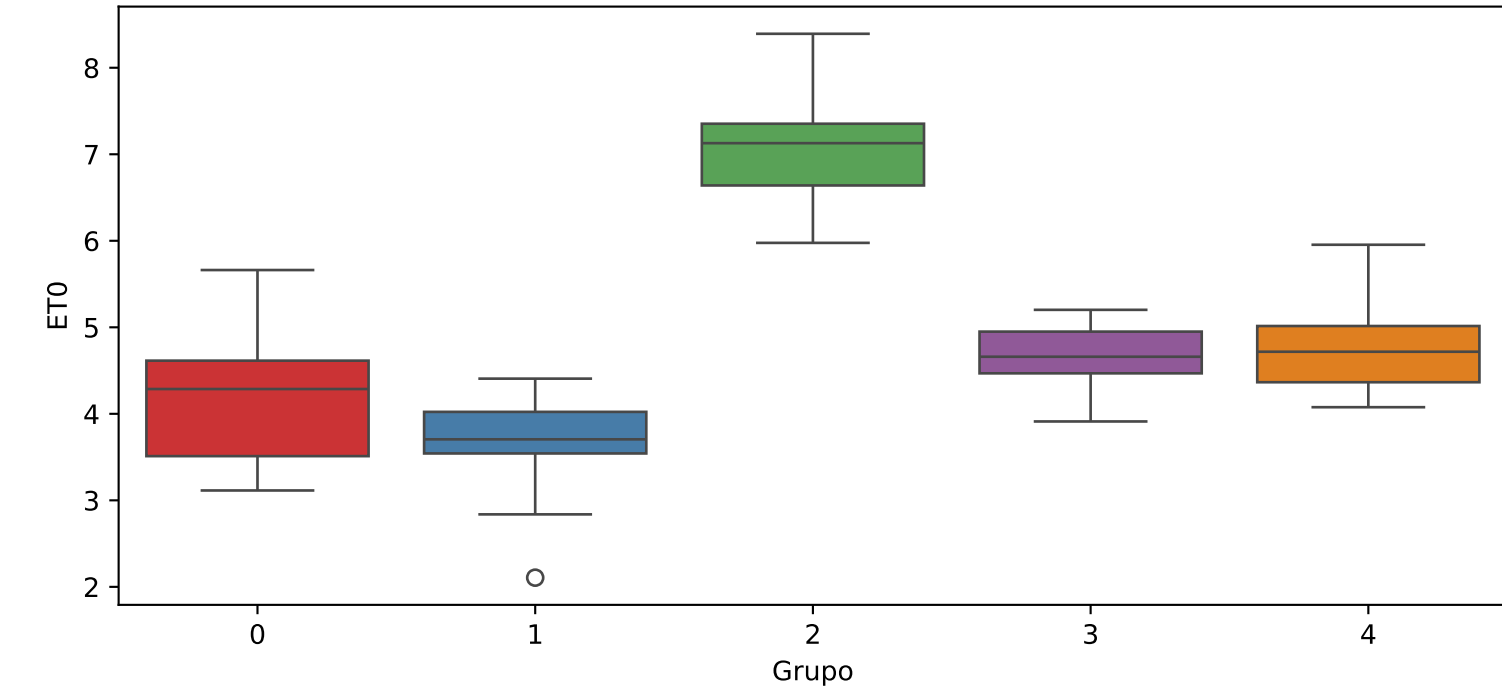
## Distribución de Ux por grupo



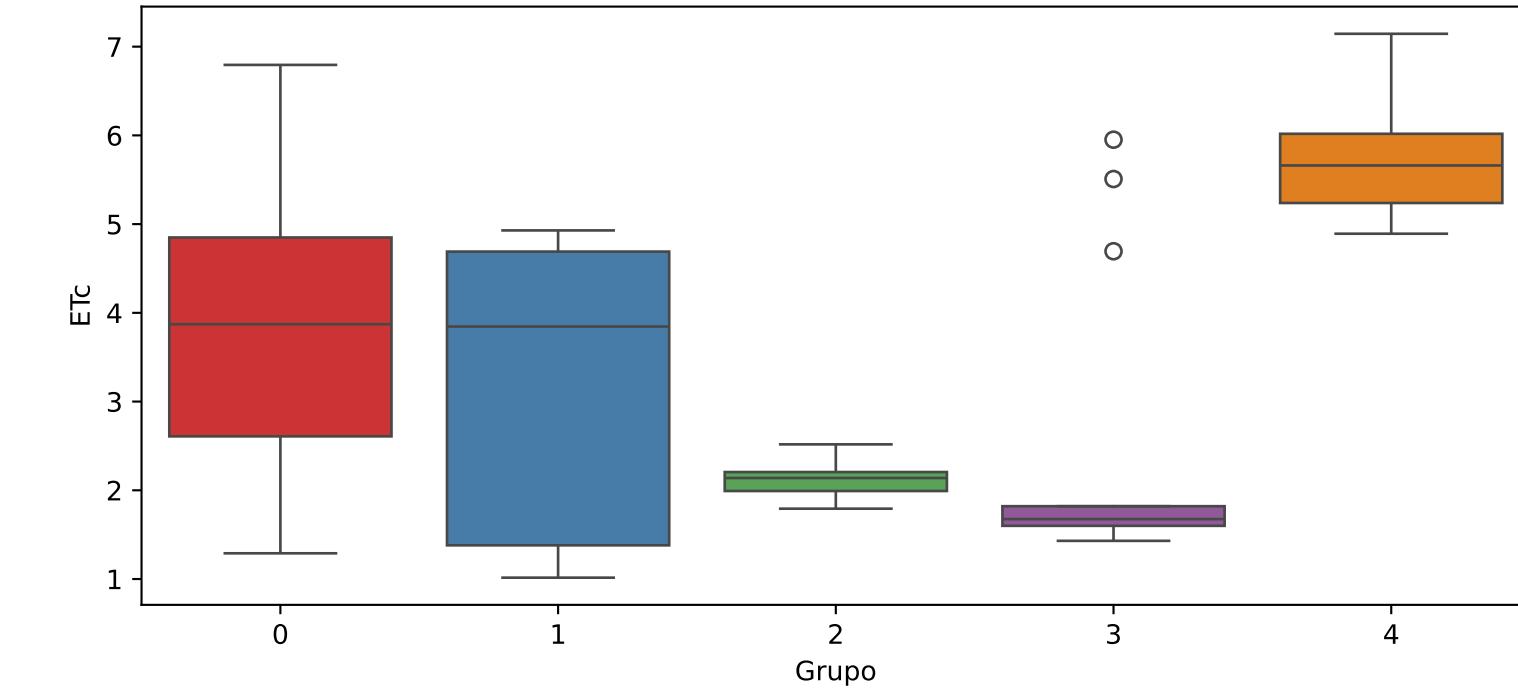
## Distribución de Rs por grupo



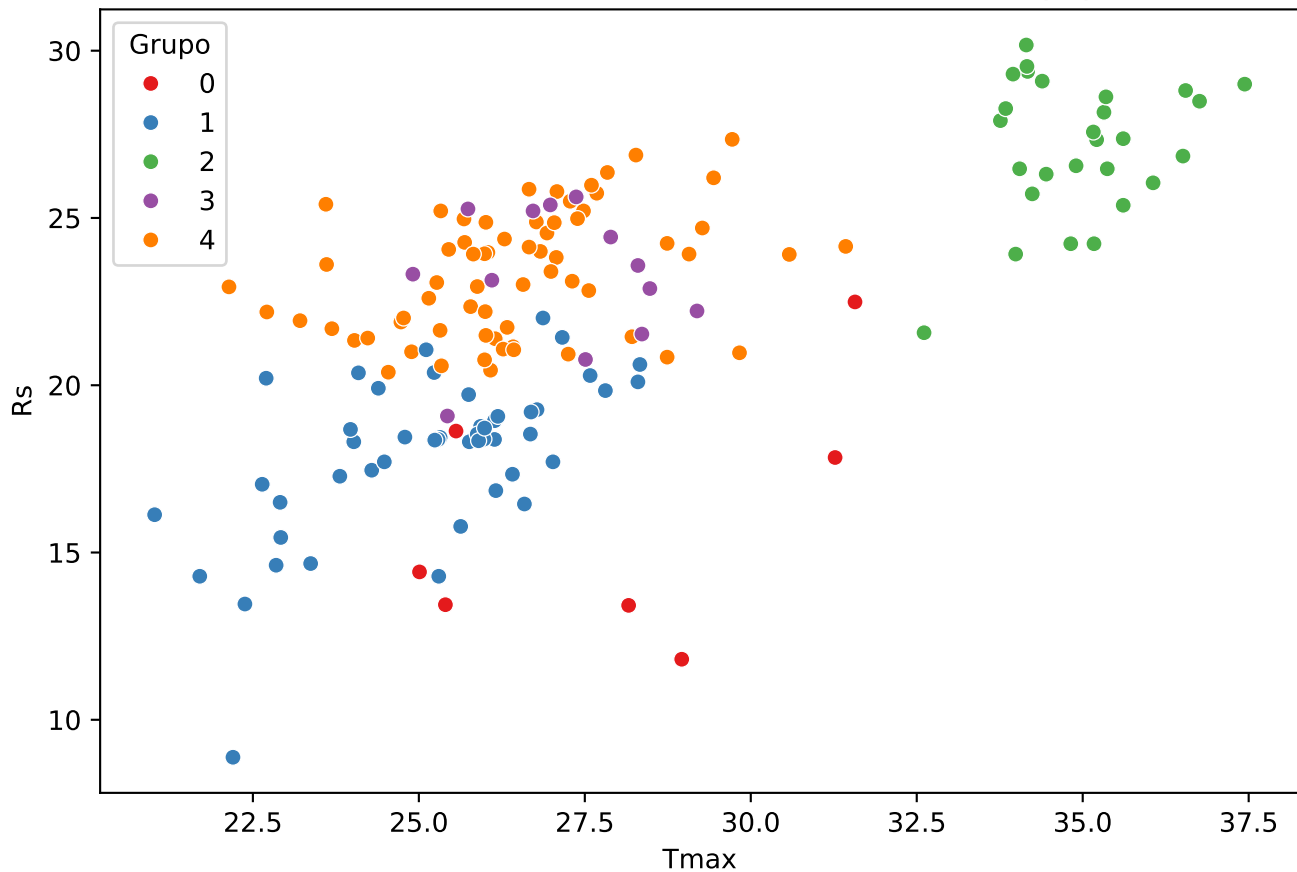
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2012)



## **Zapopan — 2013**

Días del ciclo: 161

ETc total [mm]: 613.8

ETverde total [mm]: 346.1

ETazul total [mm]: 267.7

Tmax / Tmin [°C]: 37.1 / 13.5

## Zapopan — 2013 · Resultados y métricas

[Zapopan 2013] Regresión Lineal ET0 —  $R^2$ : 0.9937 MSE: 0.0111

[Zapopan 2013] Random Forest ET0 —  $R^2$ : 0.9870 MSE: 0.0230

Importancias: {'Tmax': 0.16658924185403606, 'Tmin': 0.0039917905558934106, 'HR': 0.24998829101555878, 'Ux': 0.010088663638364052, 'Rs': 0.5693420129361477}

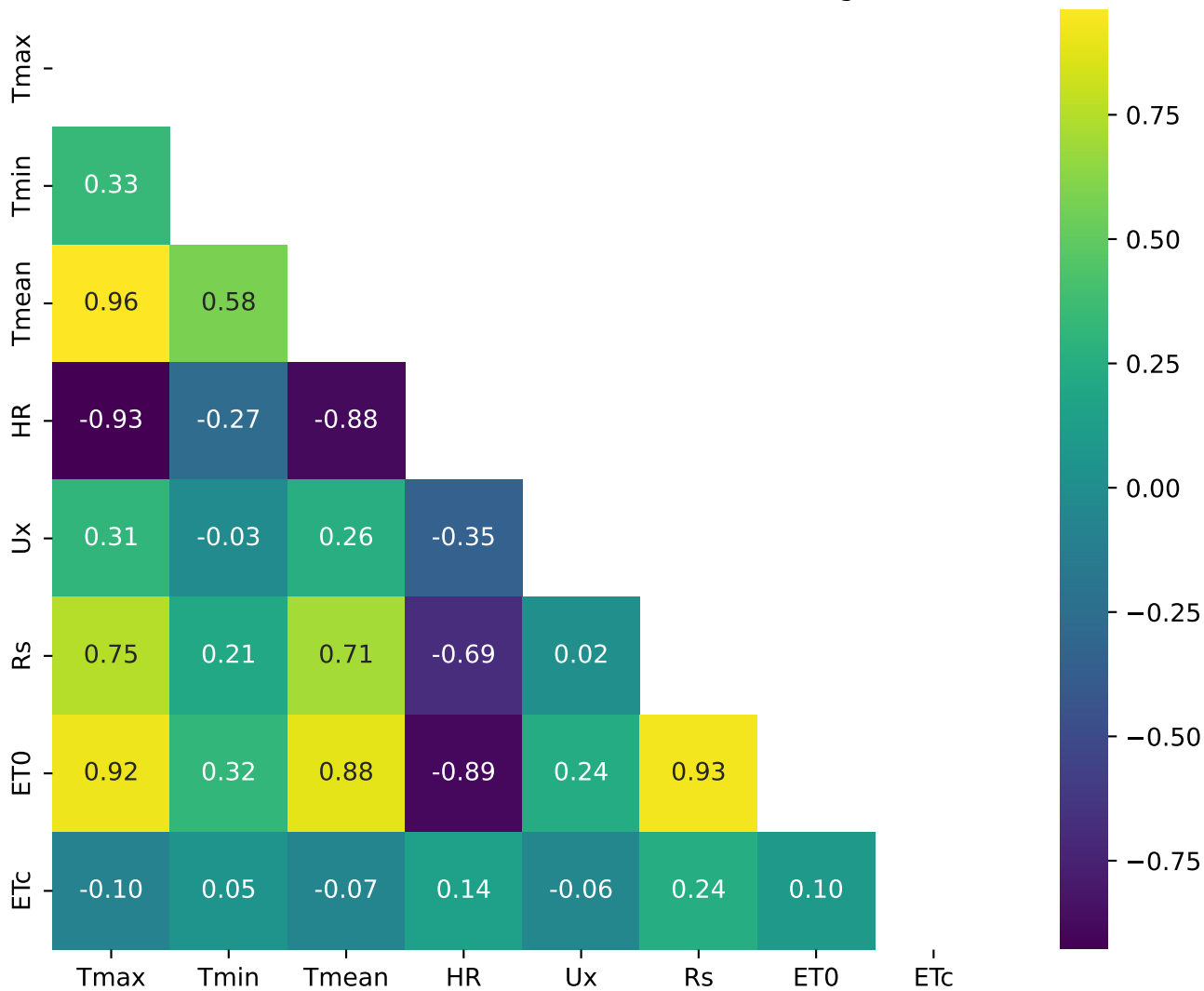
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	28.047692	16.919744	70.713590	1.168462	24.301026	5.185403	6.222484
1	33.675172	17.629655	45.275517	1.567241	25.544138	6.506576	1.951973
2	25.448621	15.940690	80.872414	0.941724	18.297586	3.632195	1.271268
3	24.340000	15.834000	82.820667	2.035333	13.828667	3.057768	3.669321
4	25.119388	16.670612	80.109184	1.019796	18.085918	3.785745	4.542894

**Zapopan — 2013**

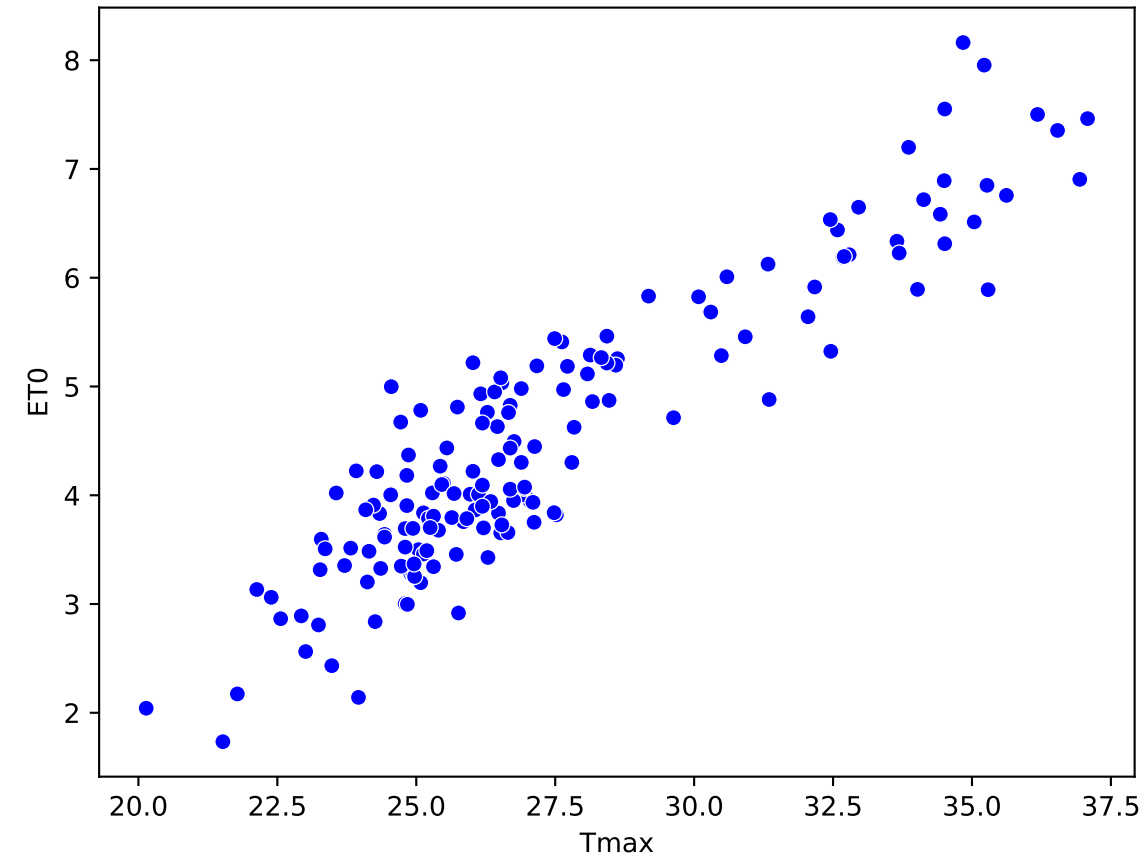


Matriz de Correlación entre Variables Meteorológicas

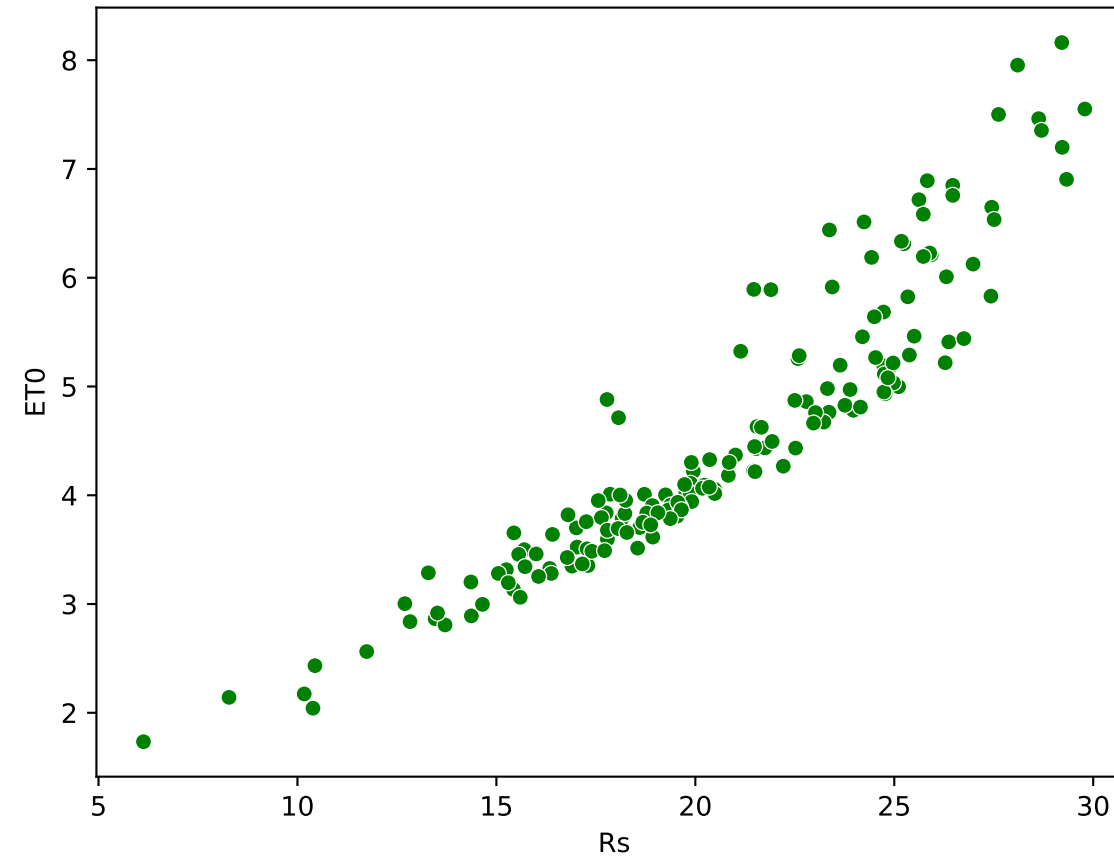


# Dispersión — Zapopan (2013)

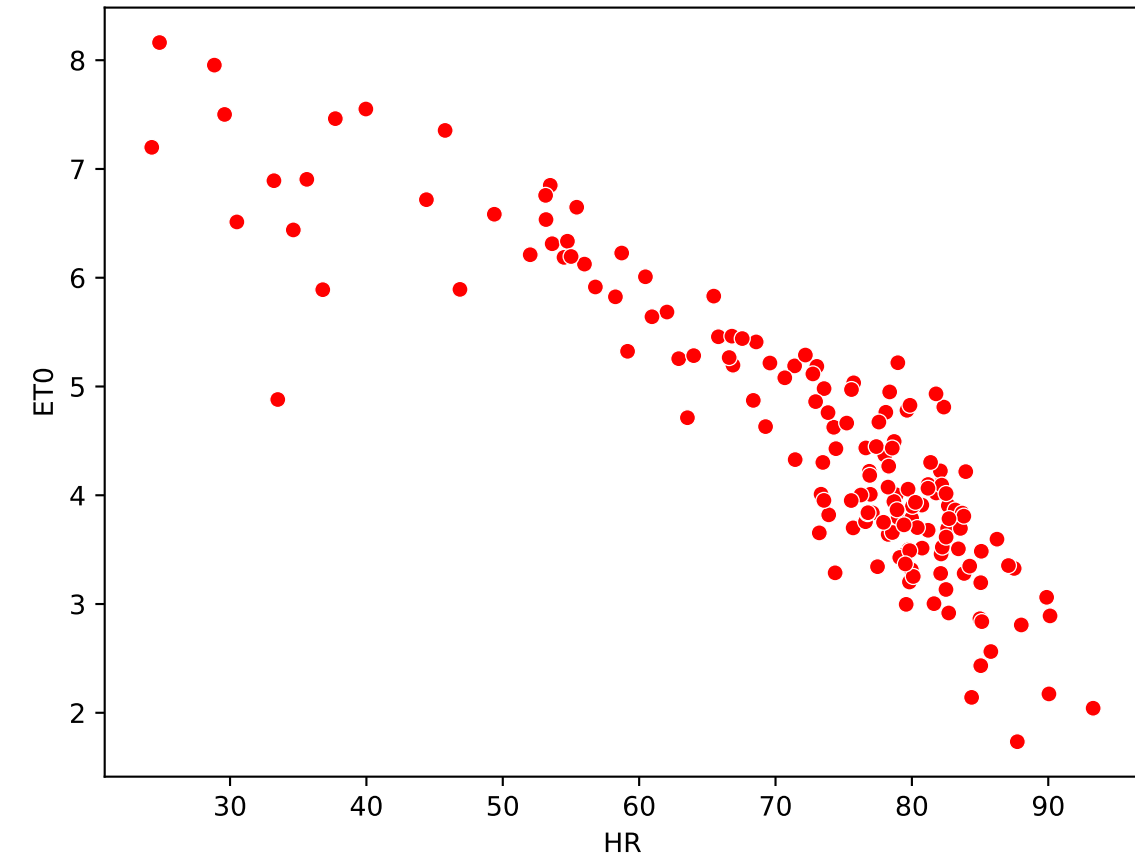
Tmax vs ET0



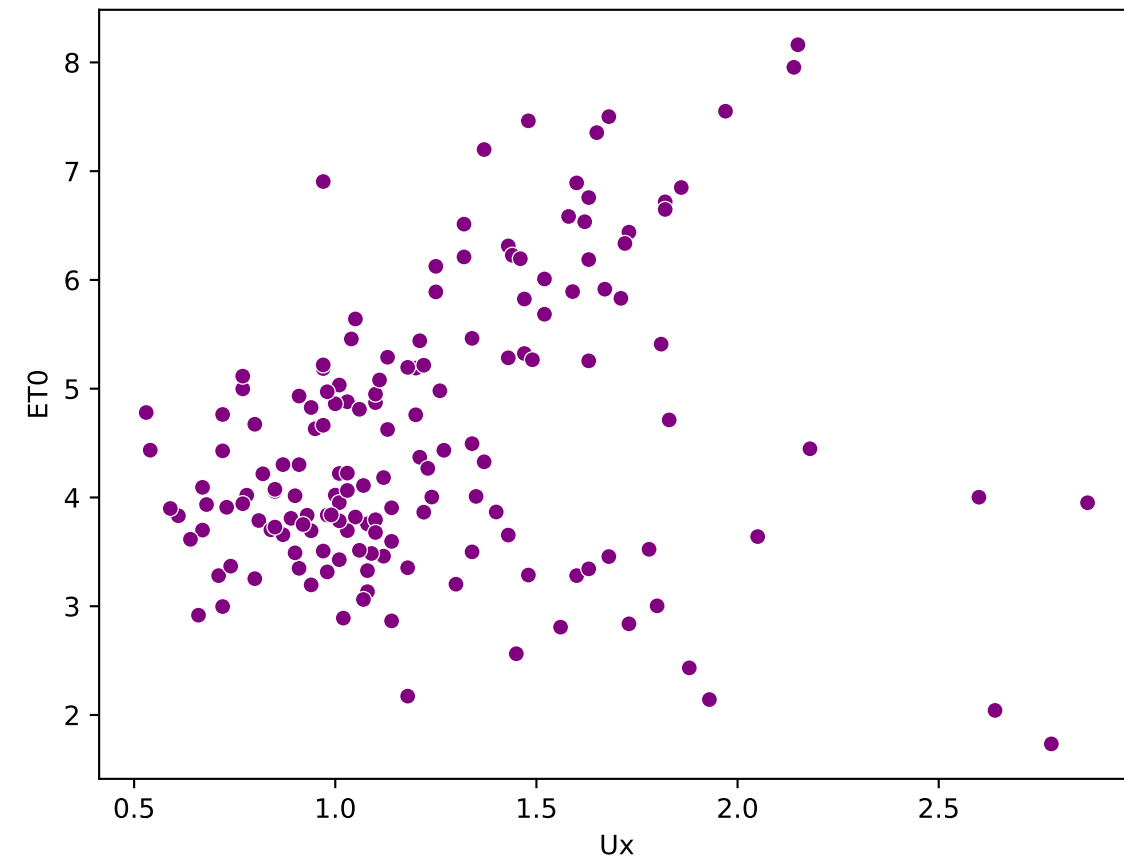
Rs vs ET0



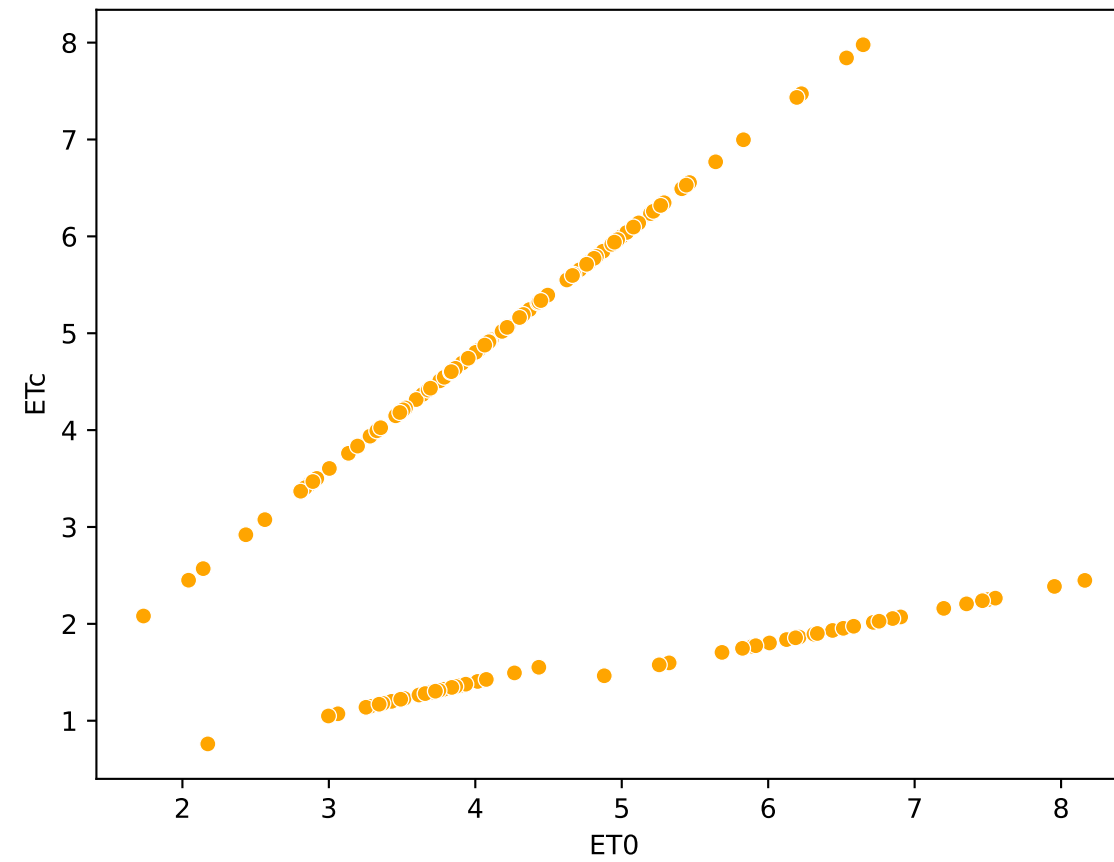
HR vs ET0



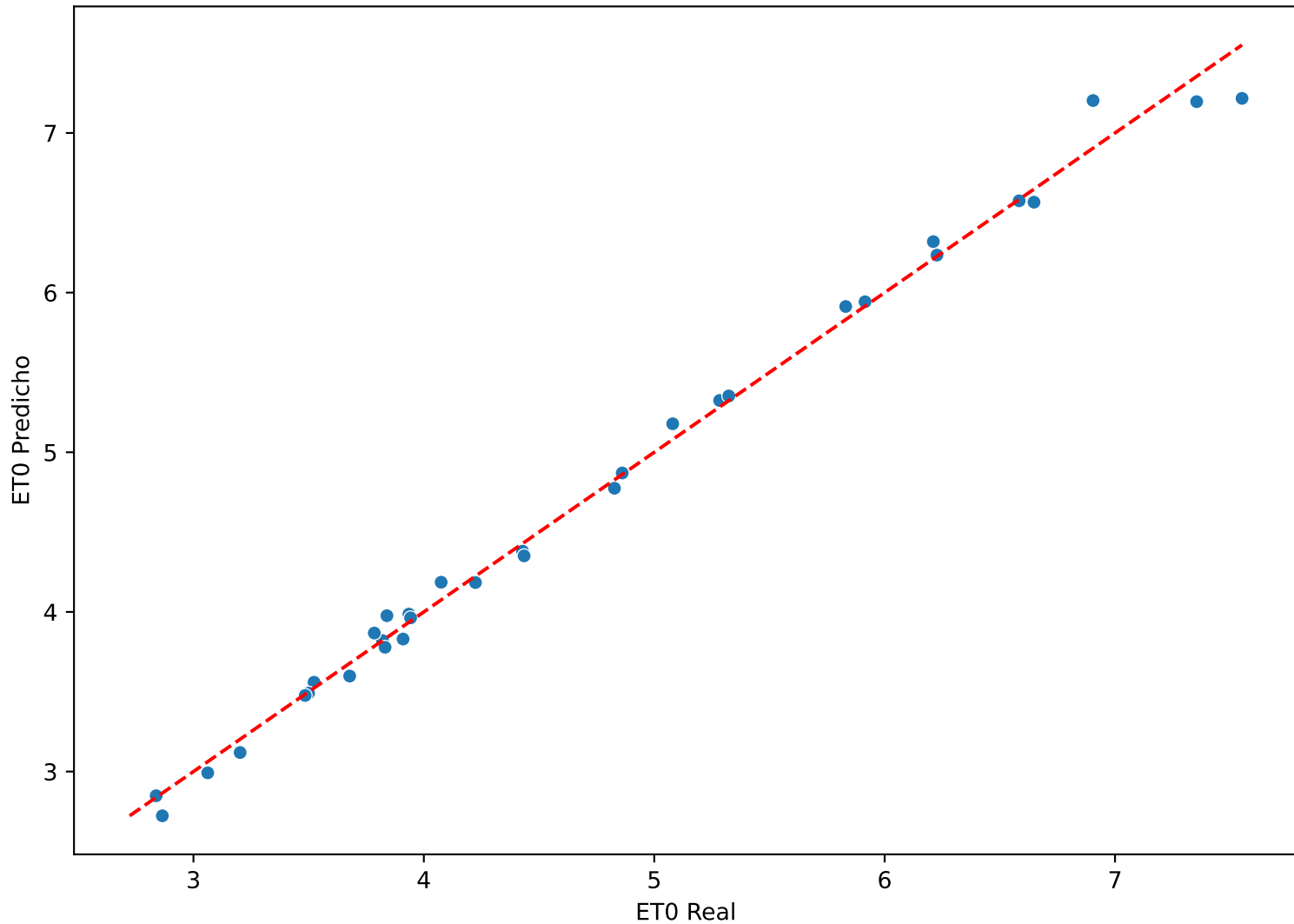
Ux vs ET0



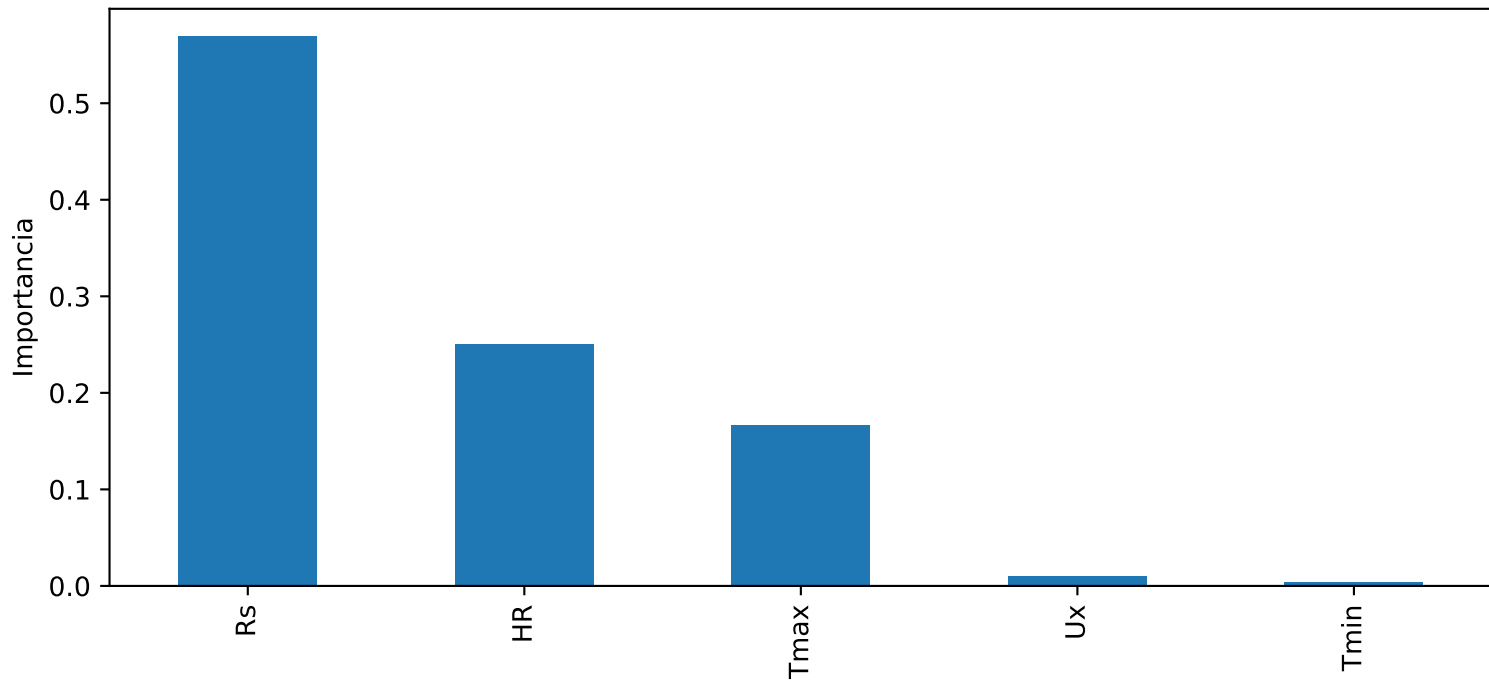
ET0 vs ETc



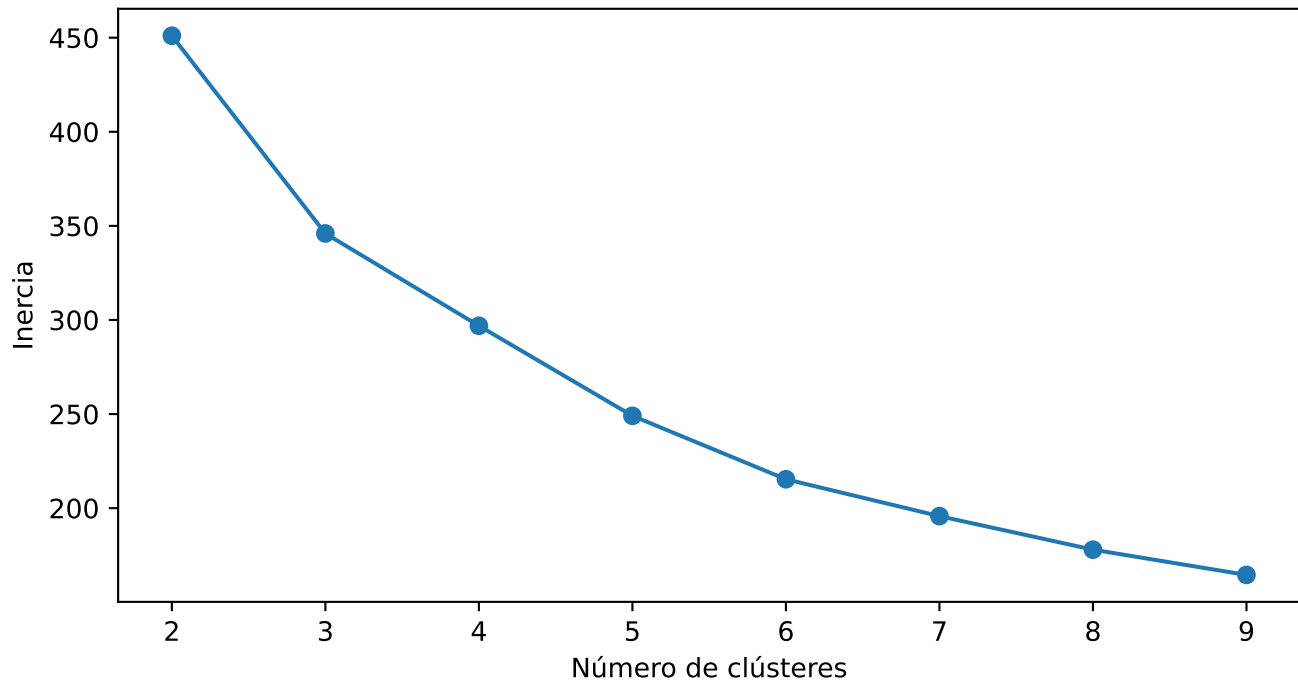
Comparación entre ET0 Real y Predicho — Zapopan (2013)



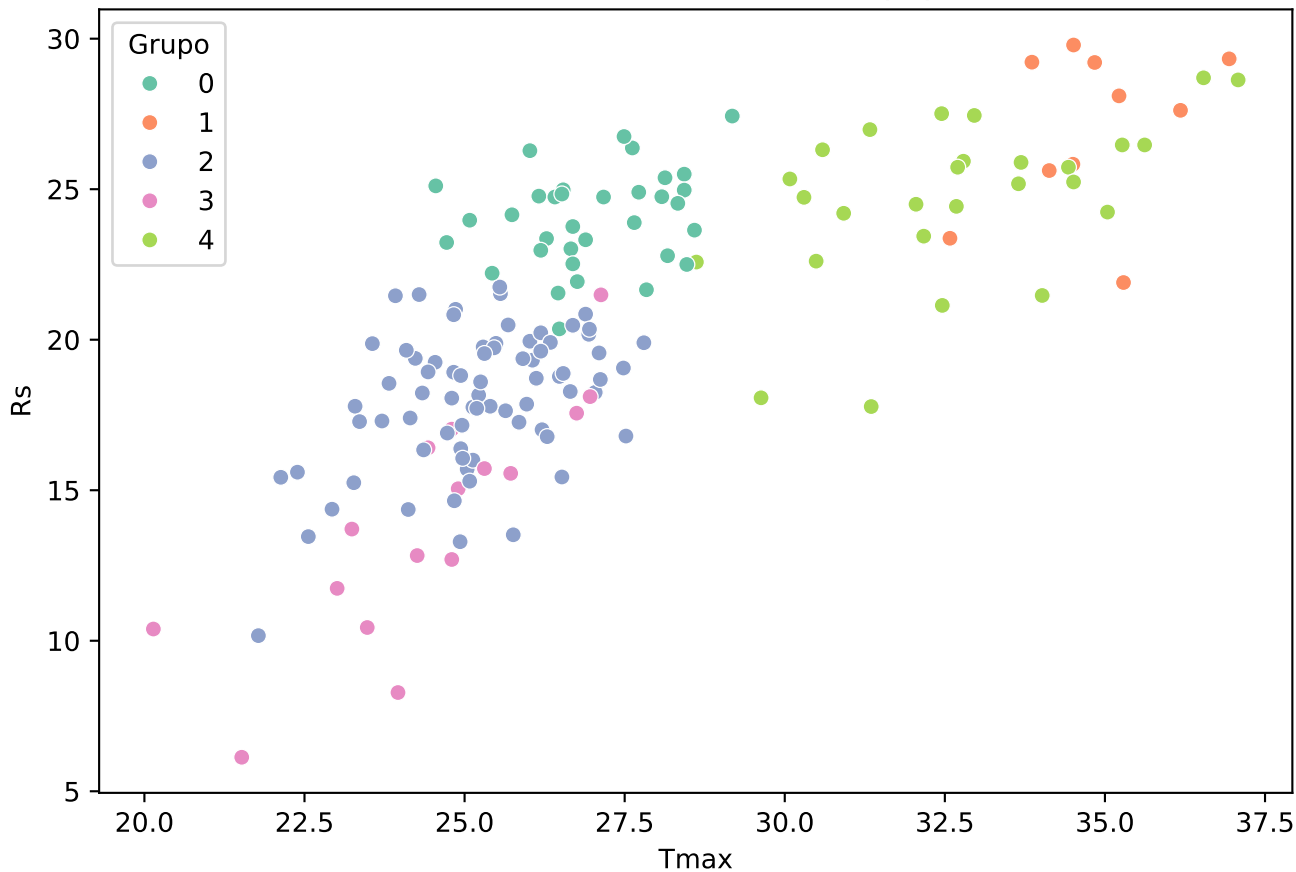
Importancia de variables (RF) — Zapopan (2013)



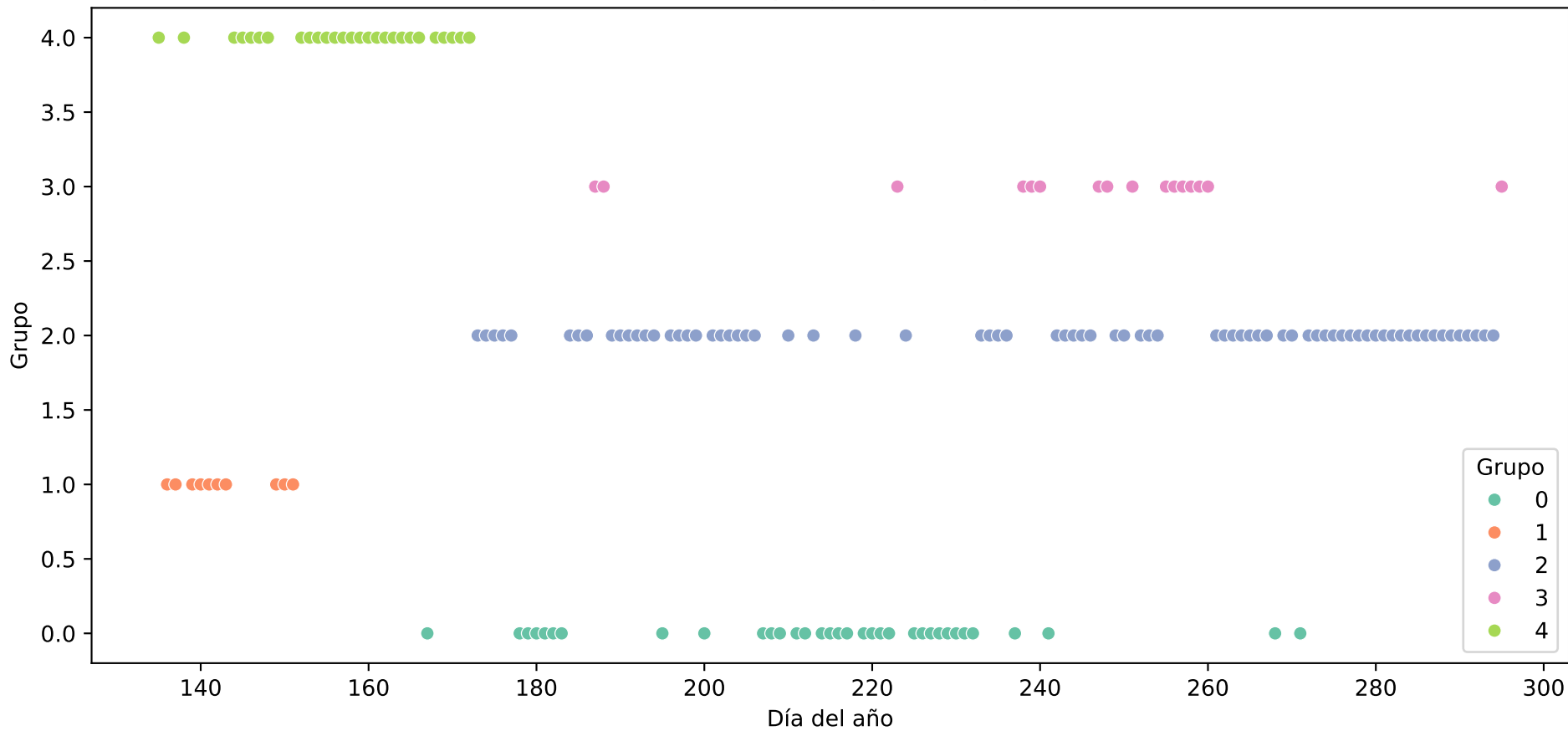
Método del codo



Clasificación de días climáticos — Zapopan (2013)

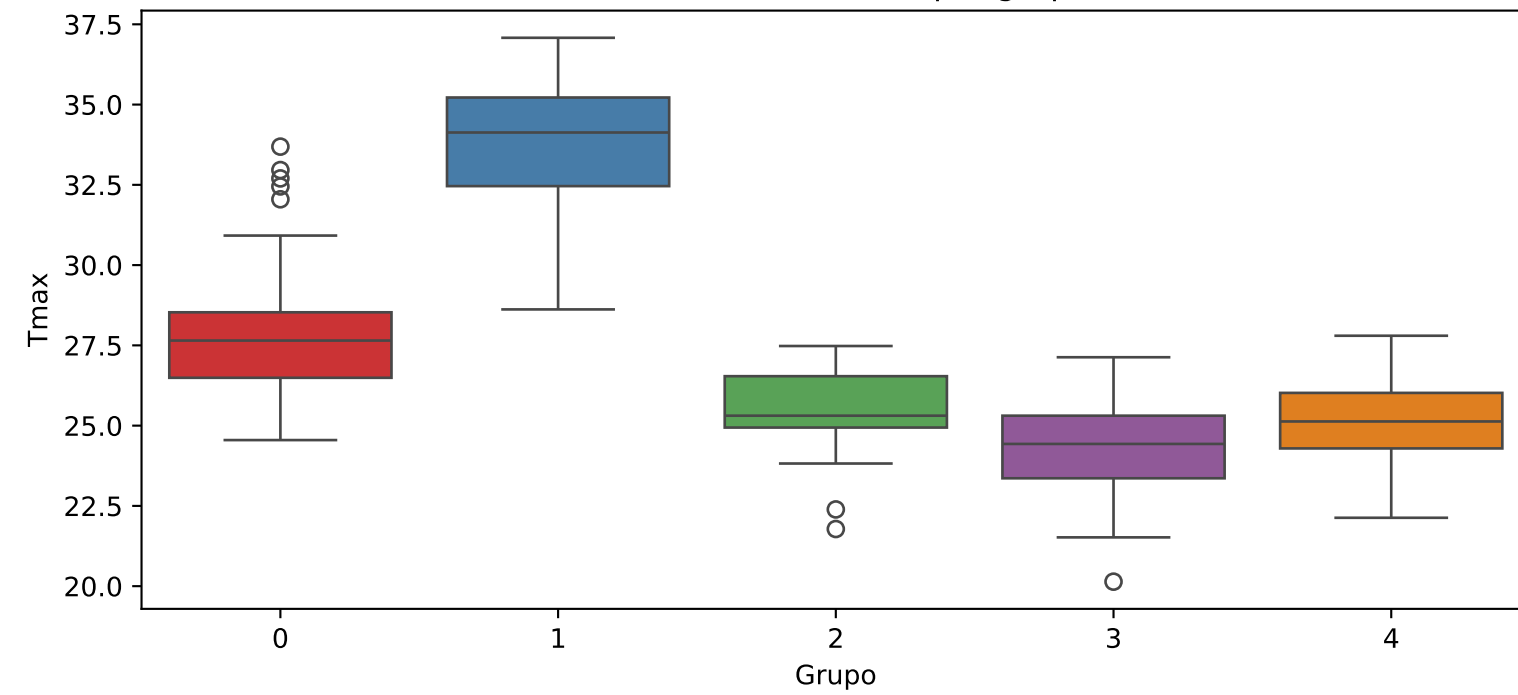


Distribución de días por grupo — Zapopan (2013)

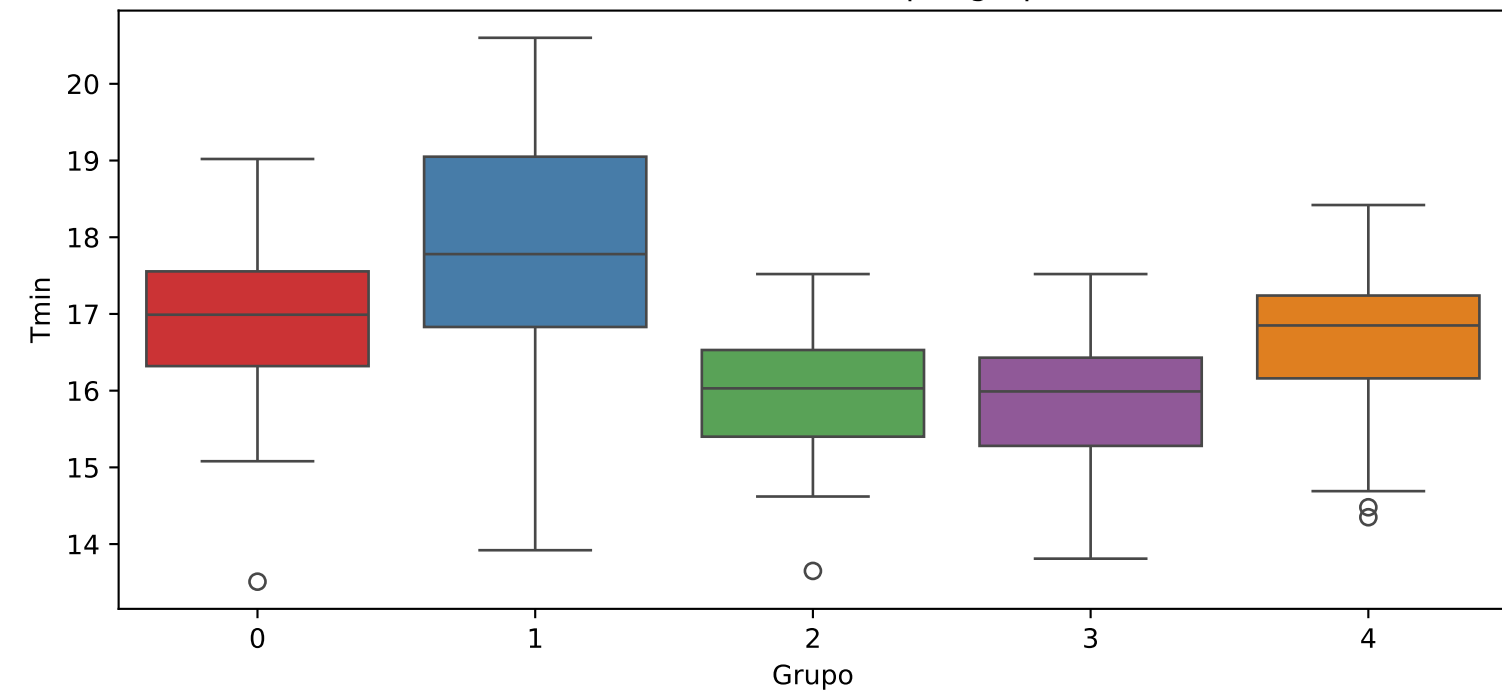


# Boxplots por grupo — Zapopan (2013)

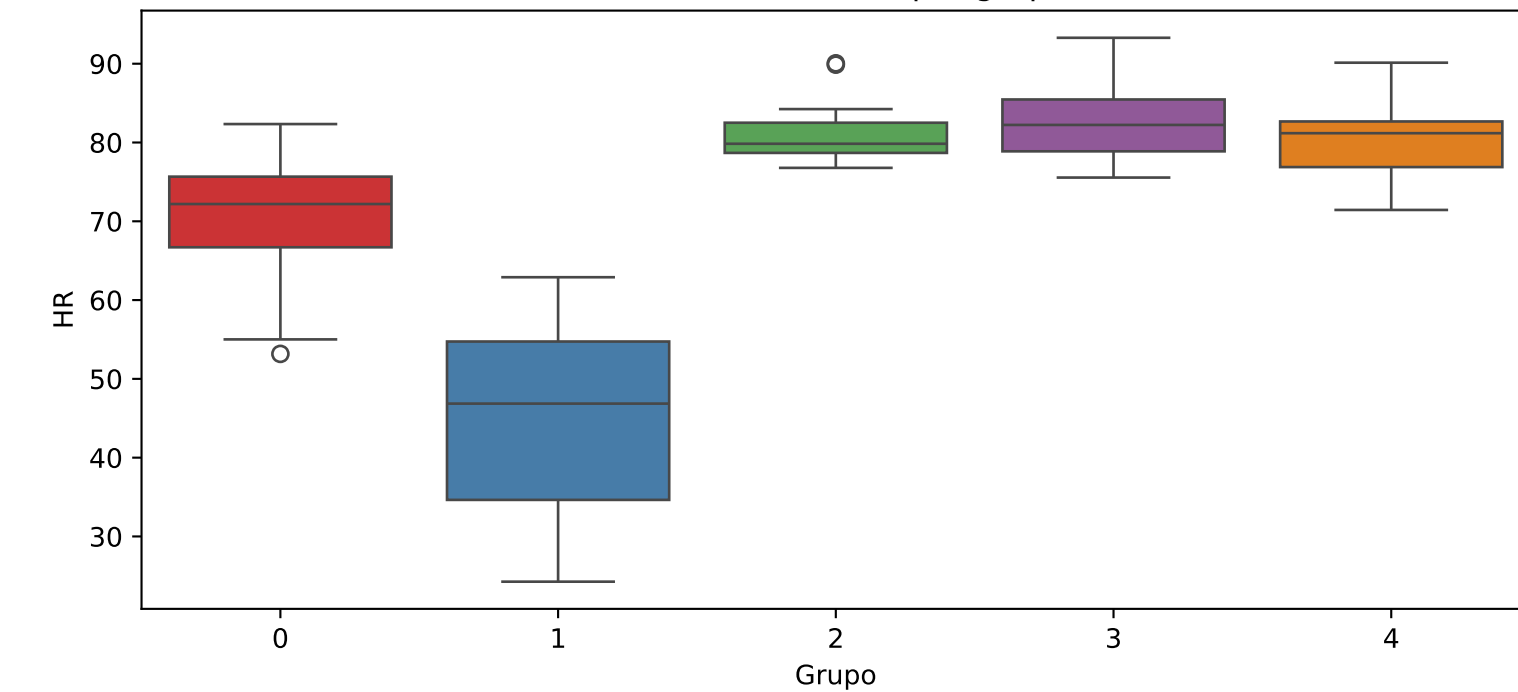
## Distribución de Tmax por grupo



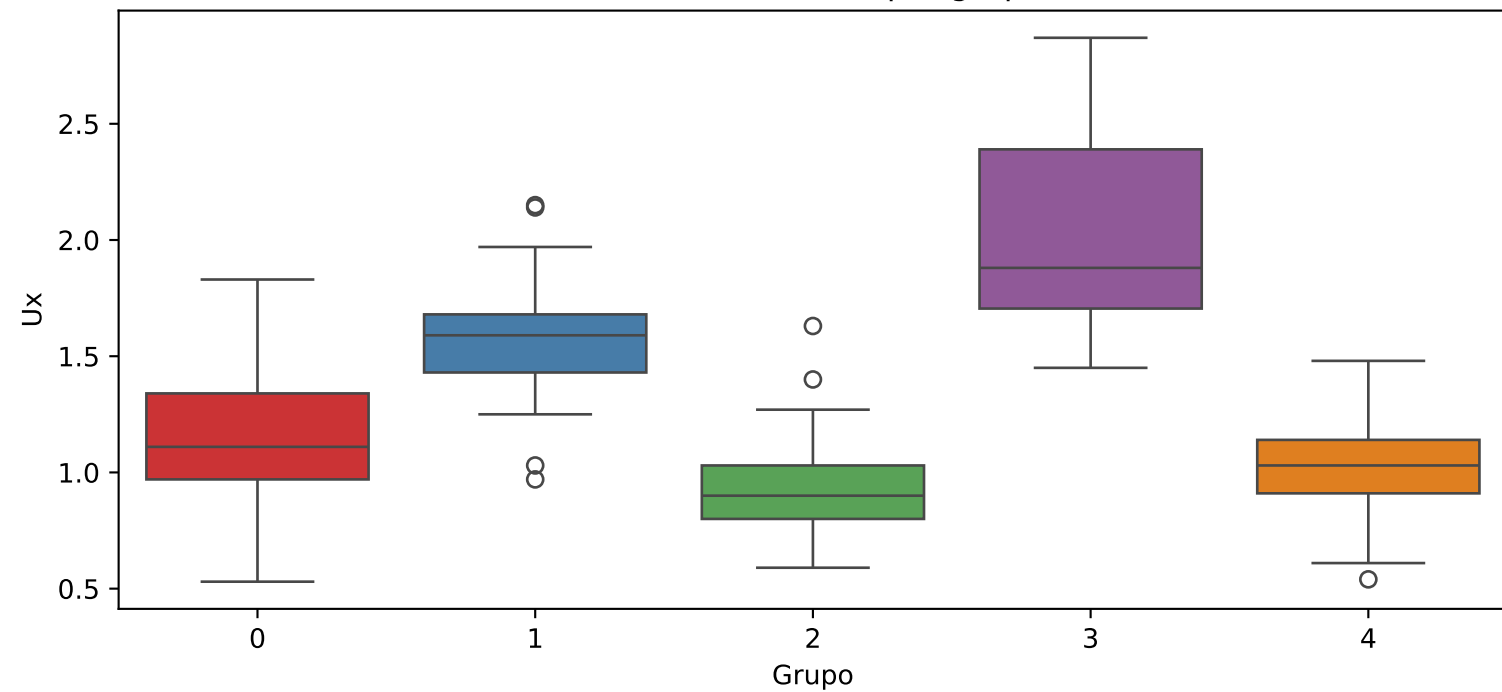
## Distribución de Tmin por grupo



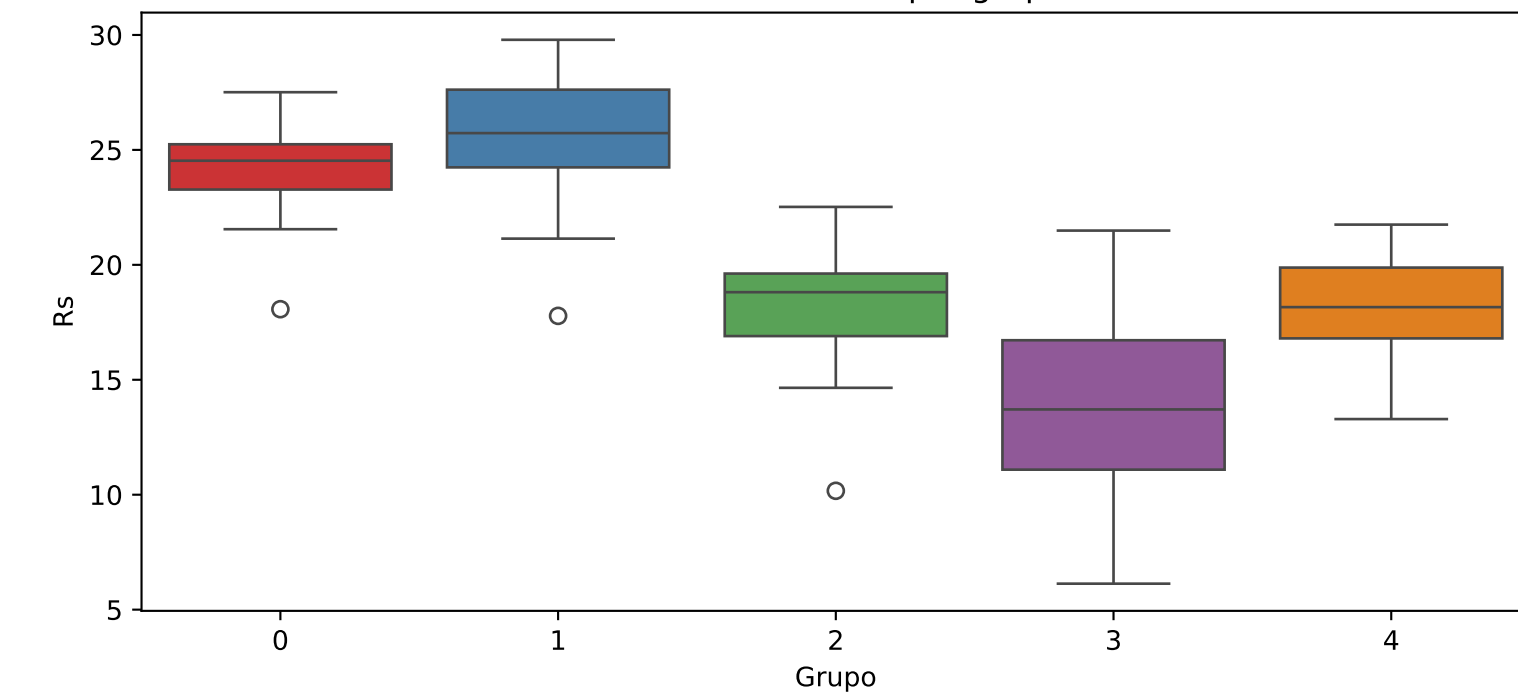
## Distribución de HR por grupo



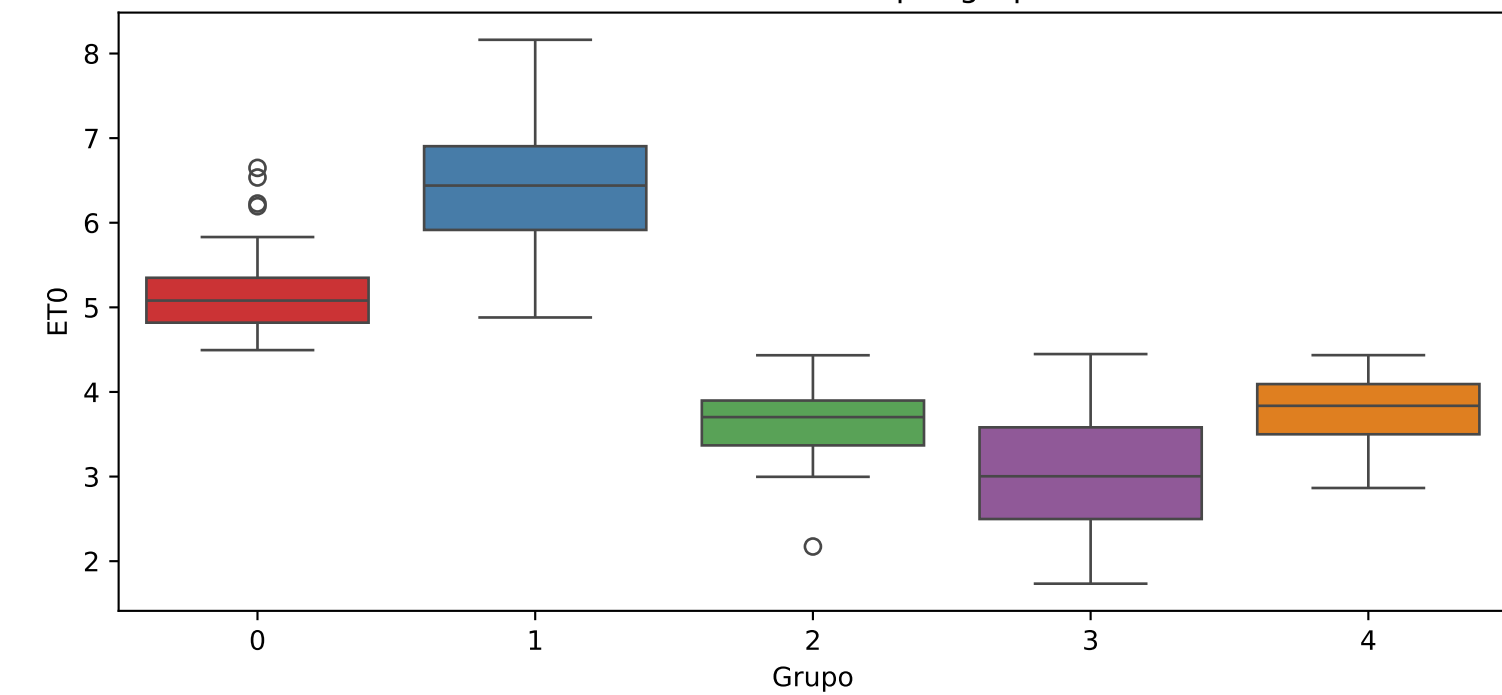
## Distribución de Ux por grupo



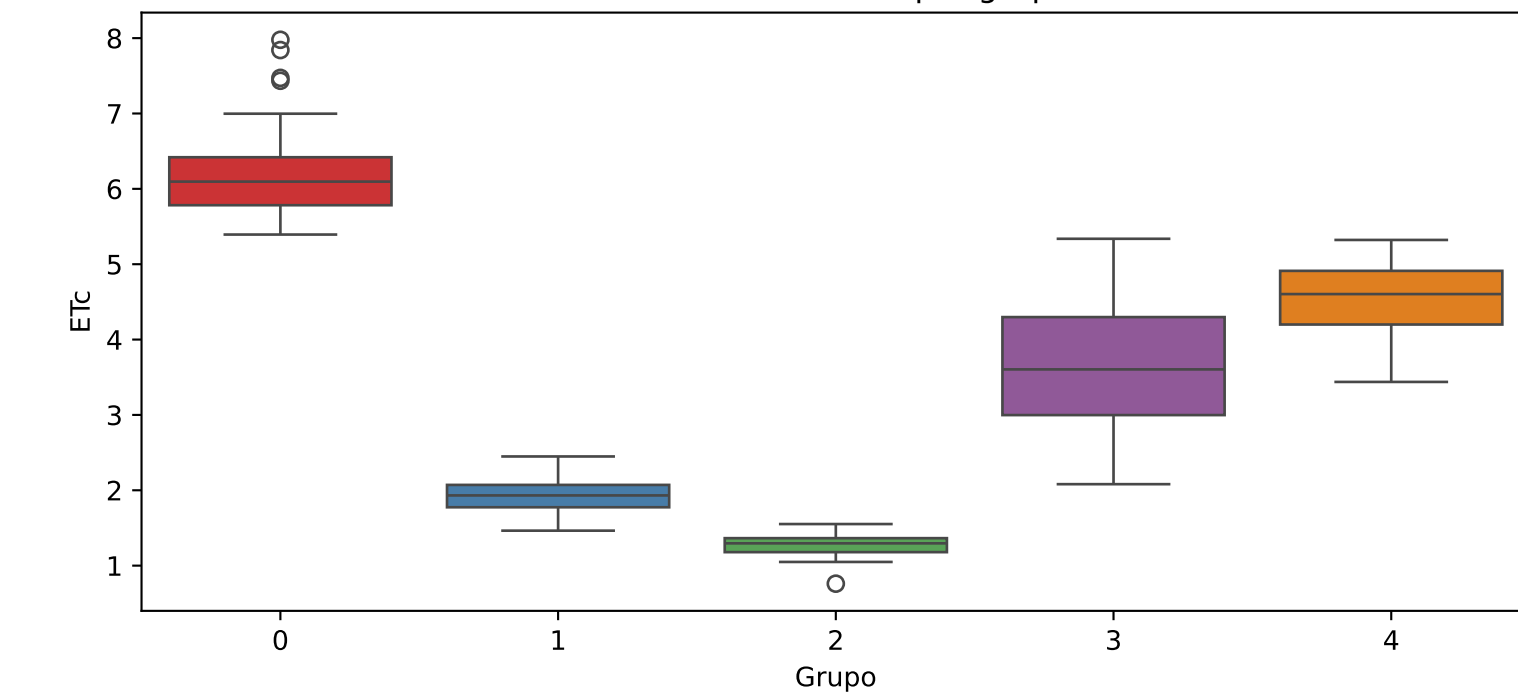
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

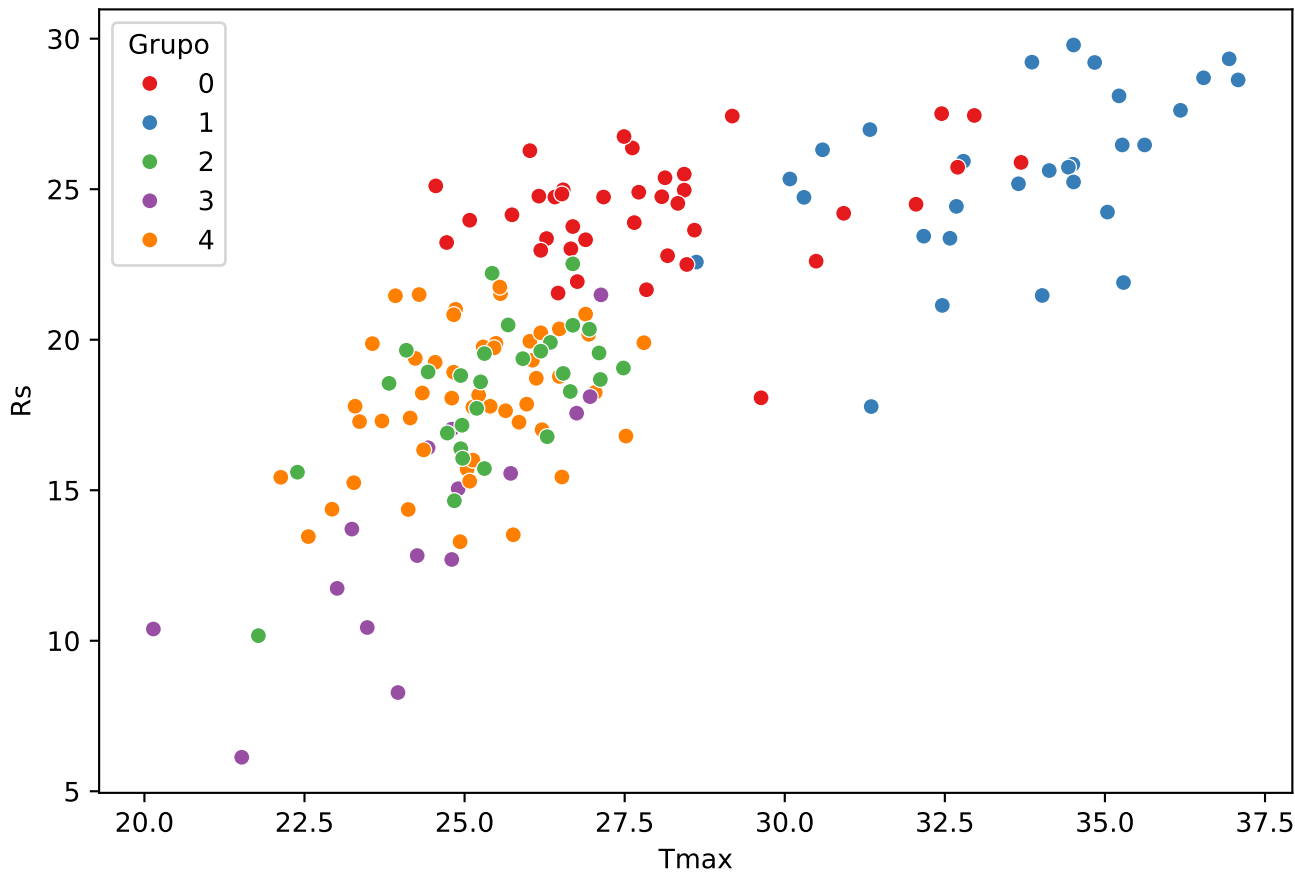


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2013)



## **Zapopan — 2014**

Días del ciclo: 161

ETc total [mm]: 620.2

ETverde total [mm]: 350.7

ETazul total [mm]: 269.5

Tmax / Tmin [°C]: 34.1 / 10.8

## Zapopan — 2014 · Resultados y métricas

[Zapopan 2014] Regresión Lineal ET0 —  $R^2$ : 0.9837 MSE: 0.0112

[Zapopan 2014] Random Forest ET0 —  $R^2$ : 0.9798 MSE: 0.0139

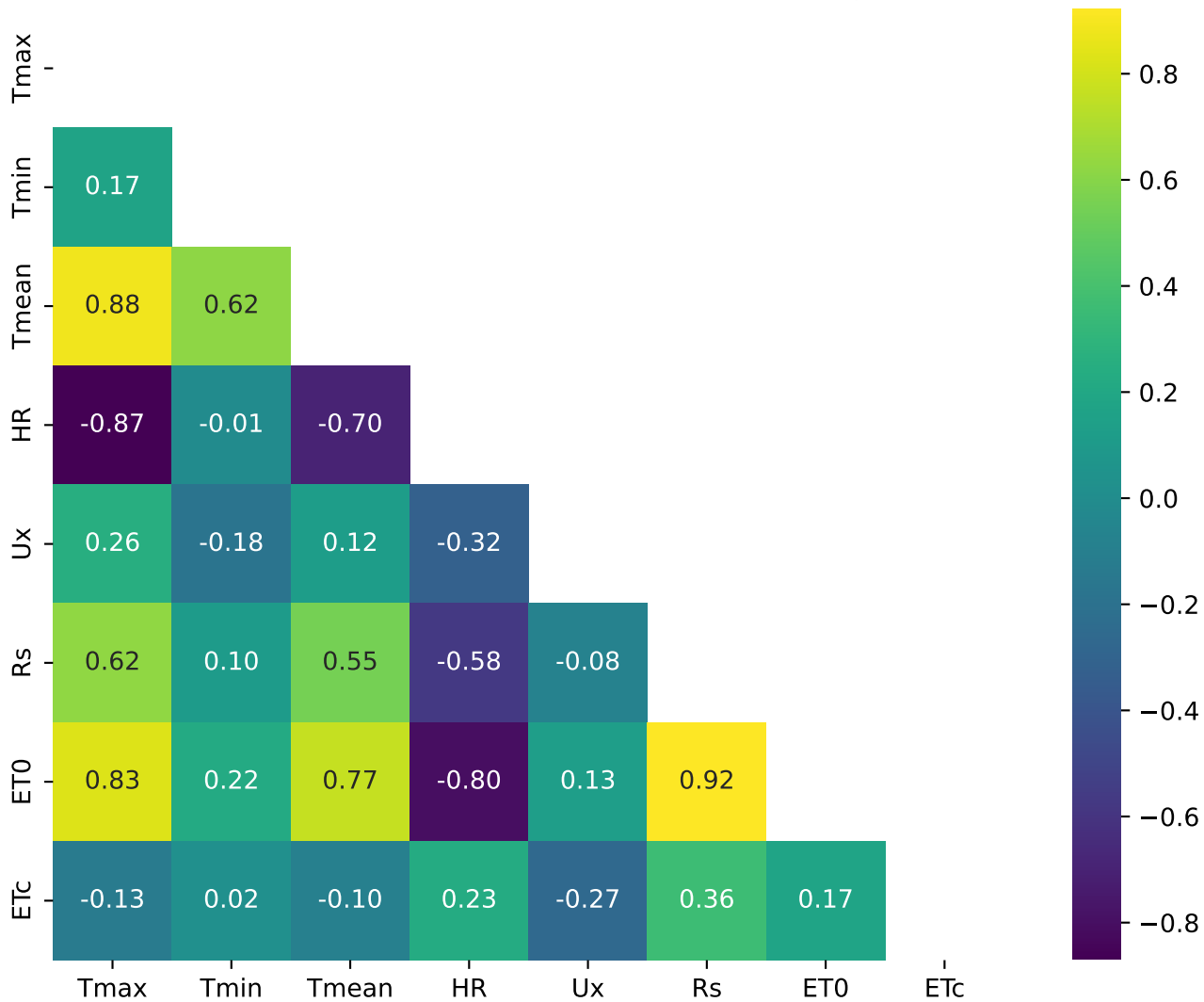
Importancias: {'Tmax': 0.0846861801738397, 'Tmin': 0.005823922255258743, 'HR': 0.05025070237579267, 'Ux': 0.013539738911679816, 'Rs': 0.845699456283429}

Estadísticas descriptivas por grupo (medias):

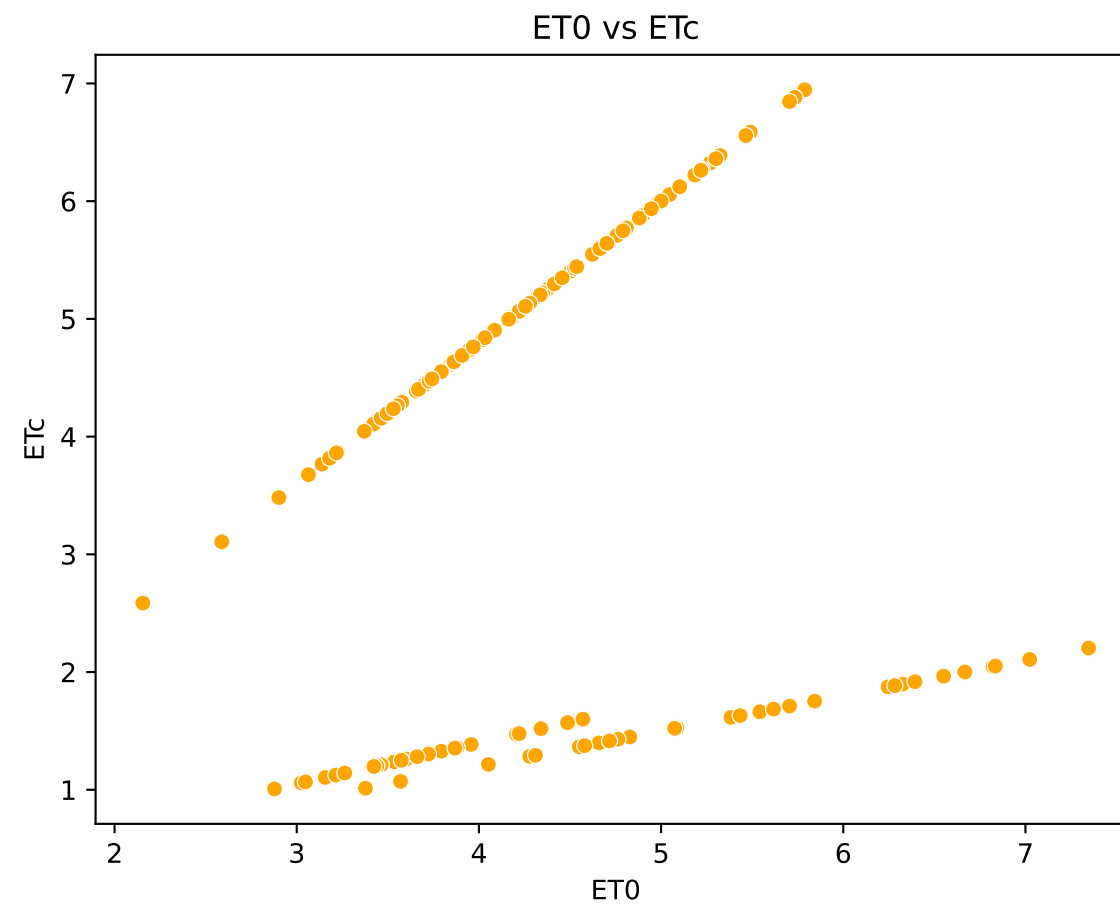
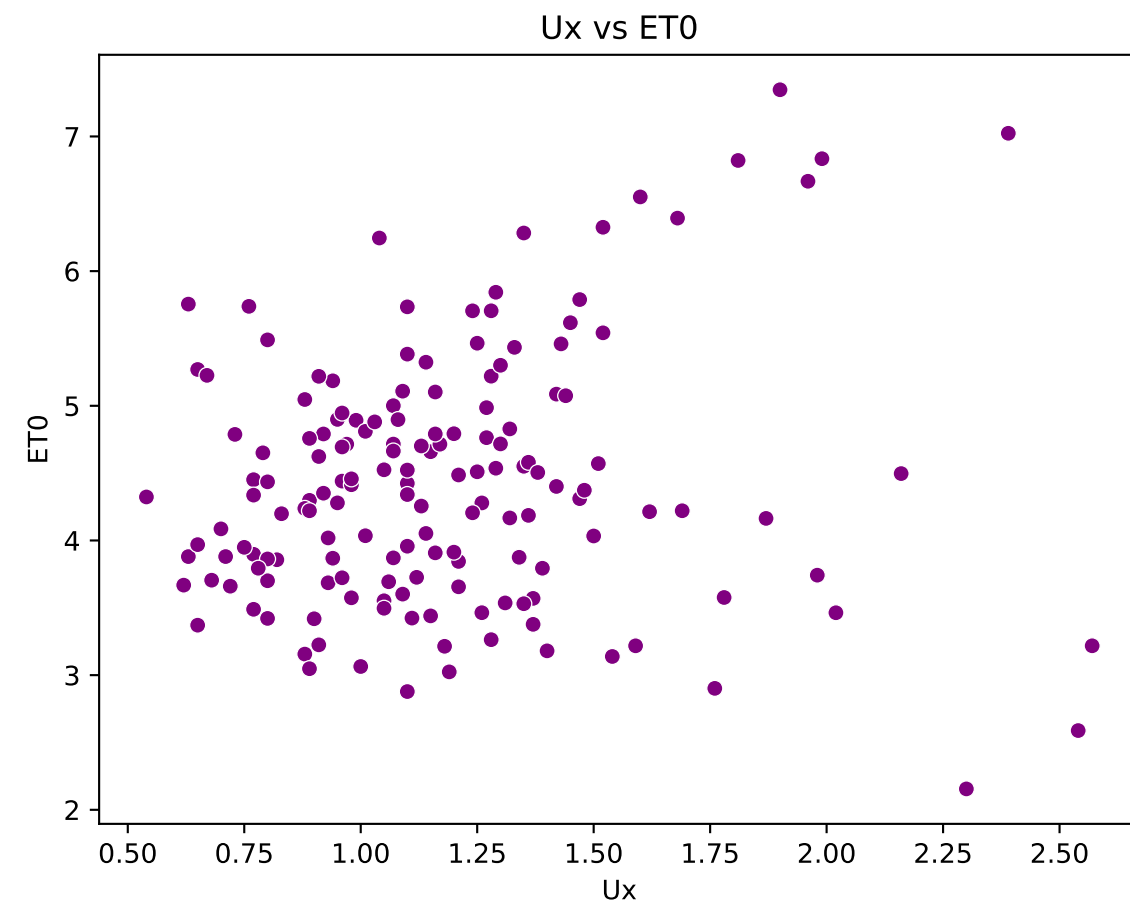
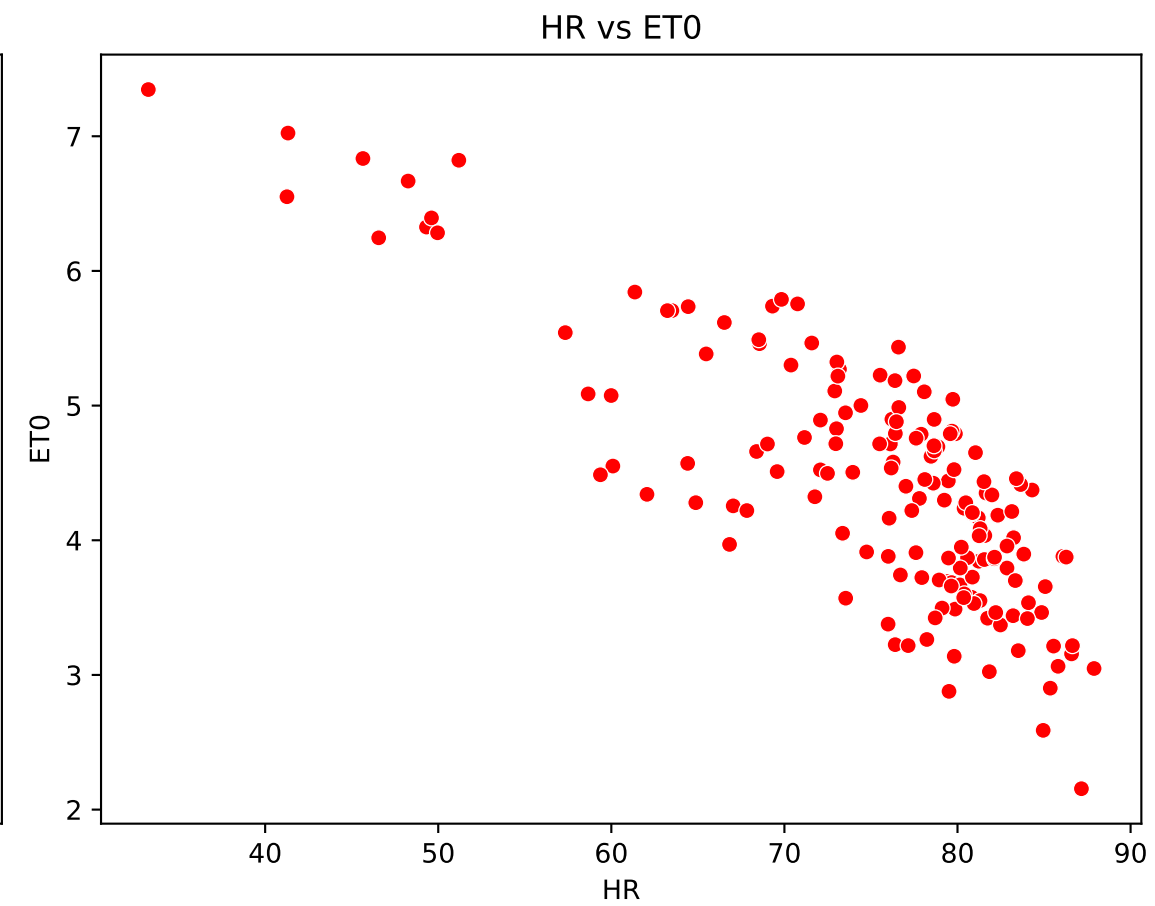
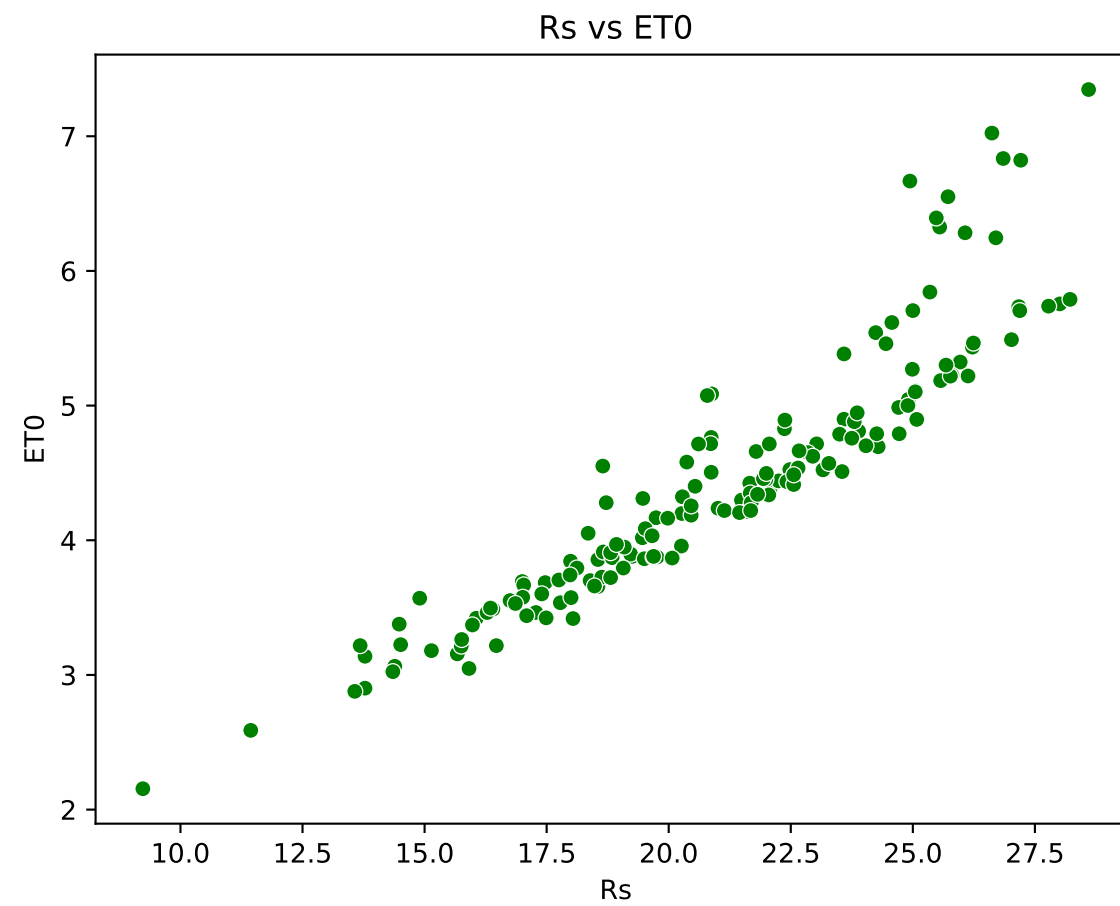
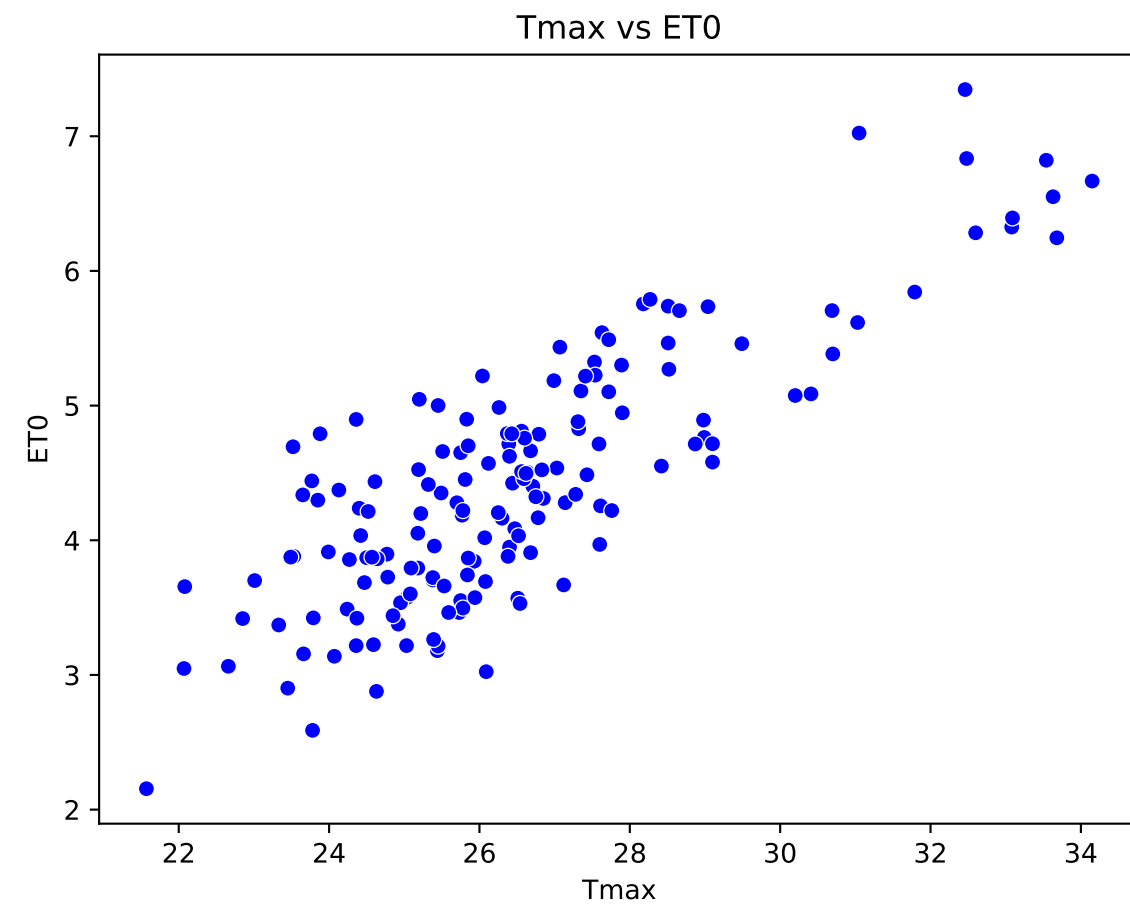
	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.496885	16.653607	76.348361	1.037377	23.542295	4.809397	5.771277
1	32.976000	17.066000	45.638000	1.724000	26.374000	6.649314	1.994794
2	25.746316	13.946316	75.320526	1.665263	18.413158	3.772399	2.854167
3	24.942909	16.575818	81.059818	1.029455	17.673636	3.638323	3.089031
4	28.871875	18.203125	67.126875	1.312500	22.108750	5.023437	1.507031

**Zapopan — 2014**

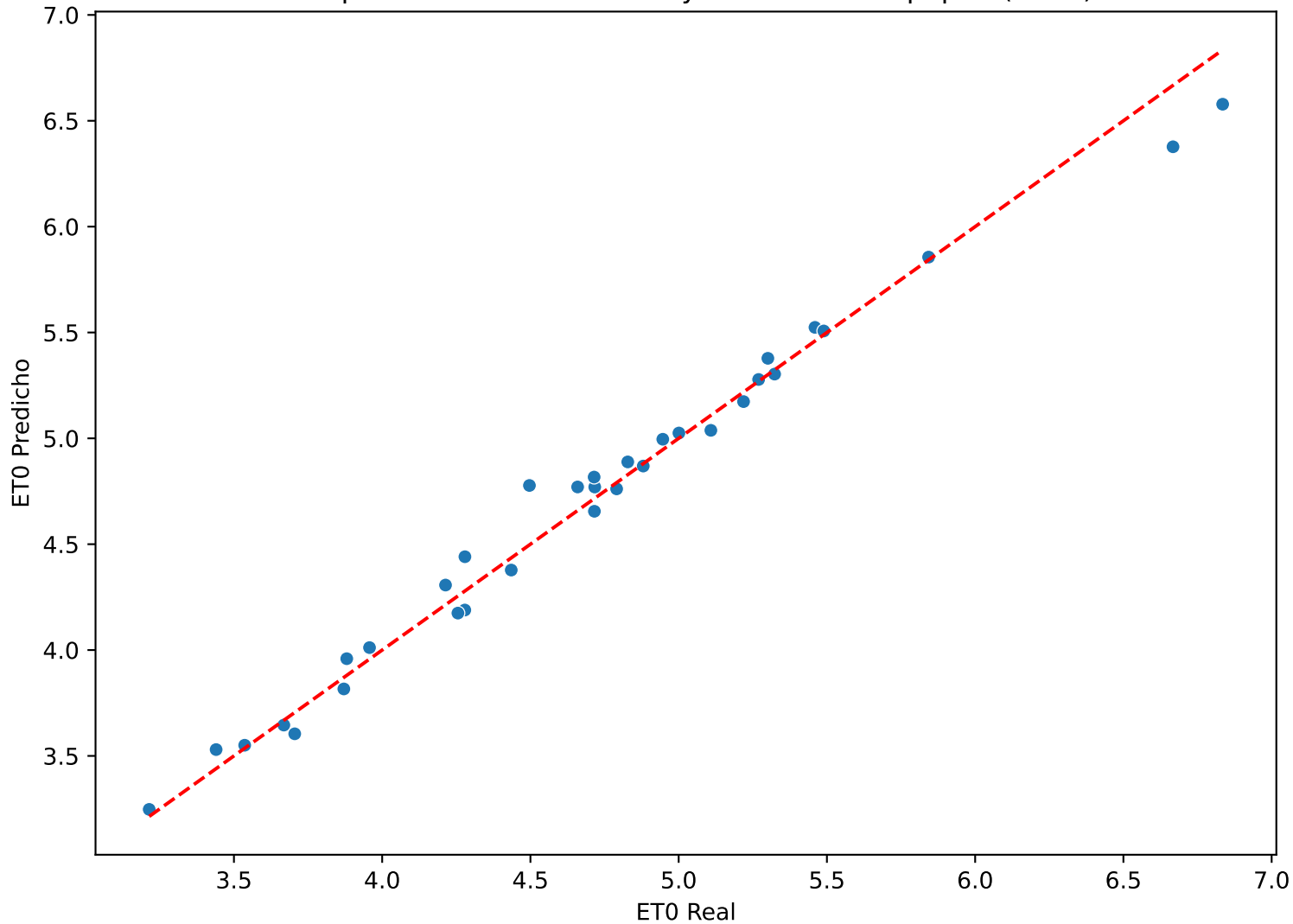
Matriz de Correlación entre Variables Meteorológicas



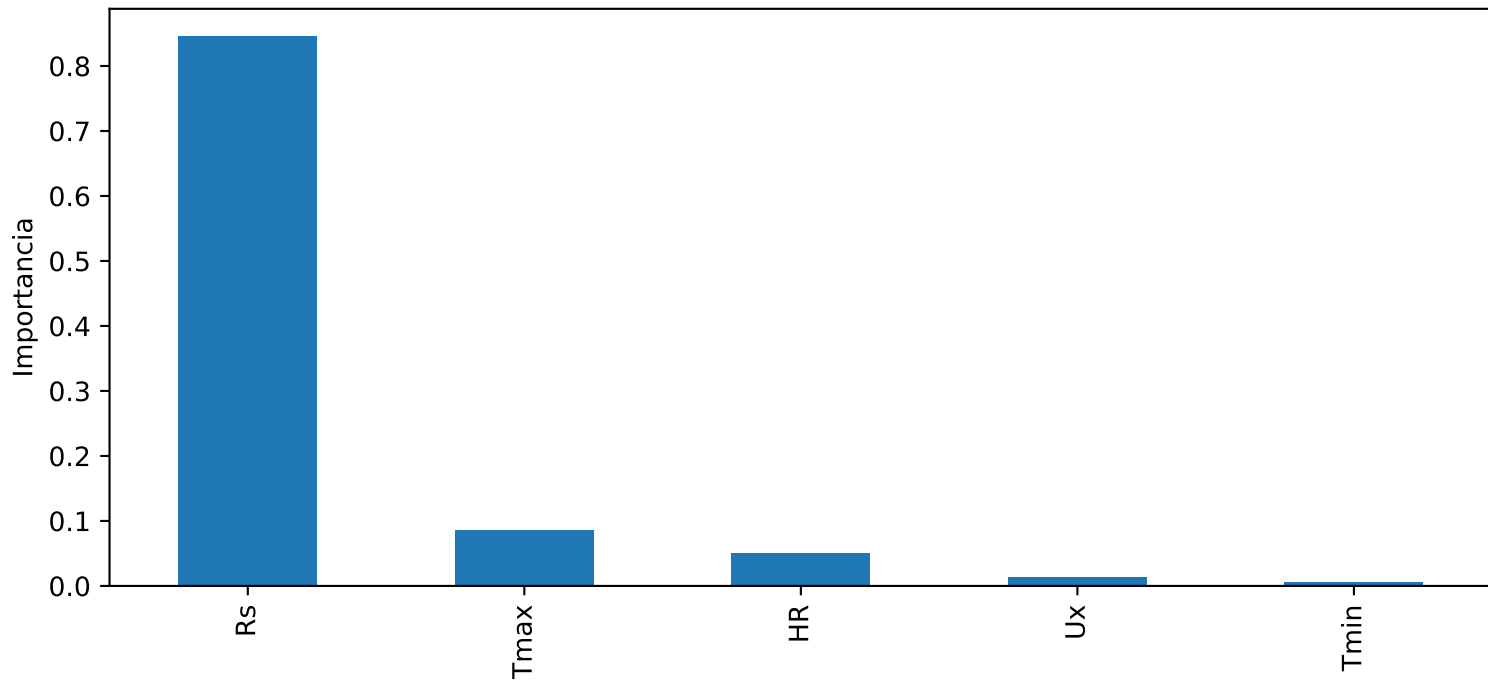
Dispersión — Zapopan (2014)



Comparación entre ET0 Real y Predicho — Zapopan (2014)

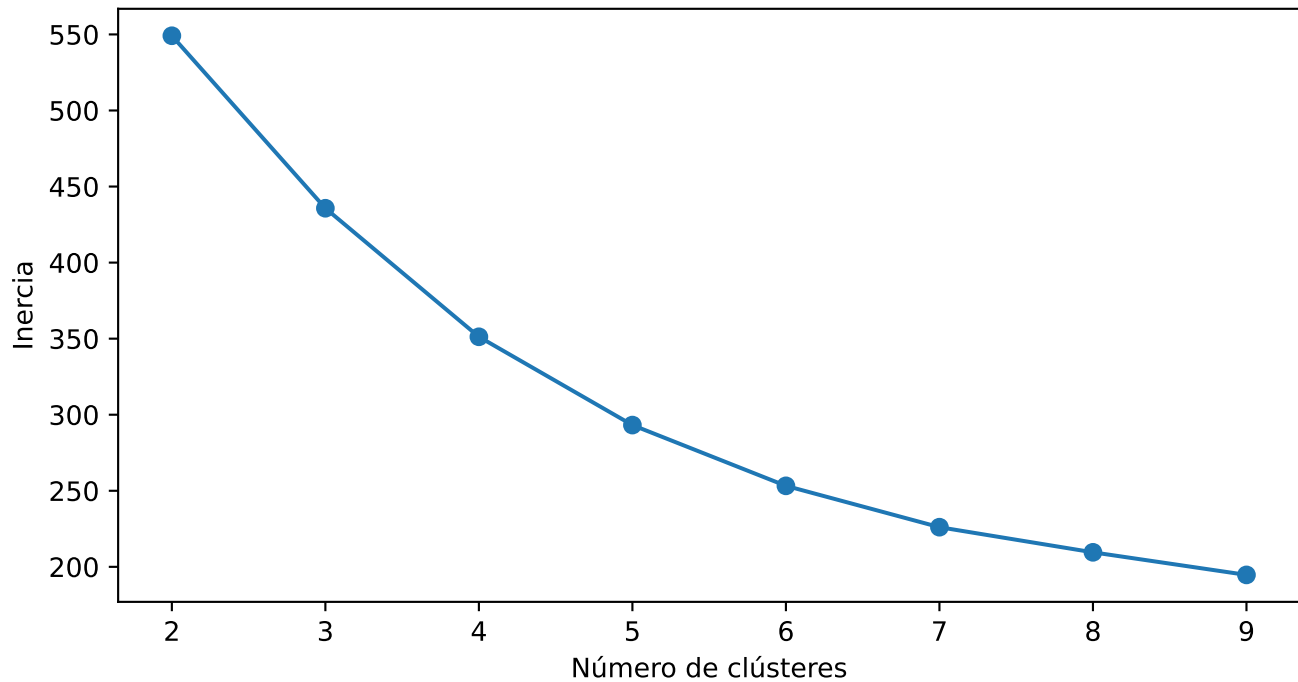


Importancia de variables (RF) — Zapopan (2014)

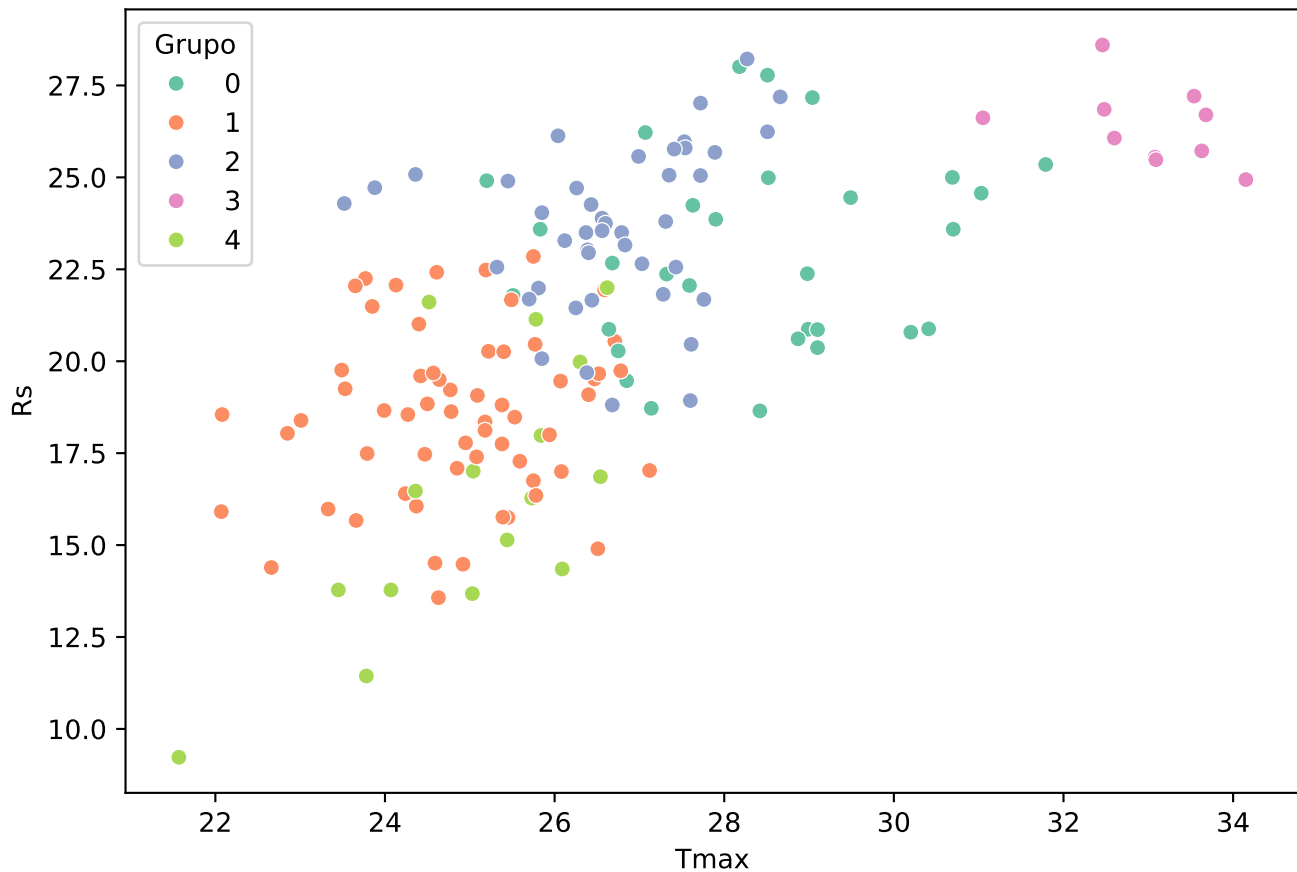




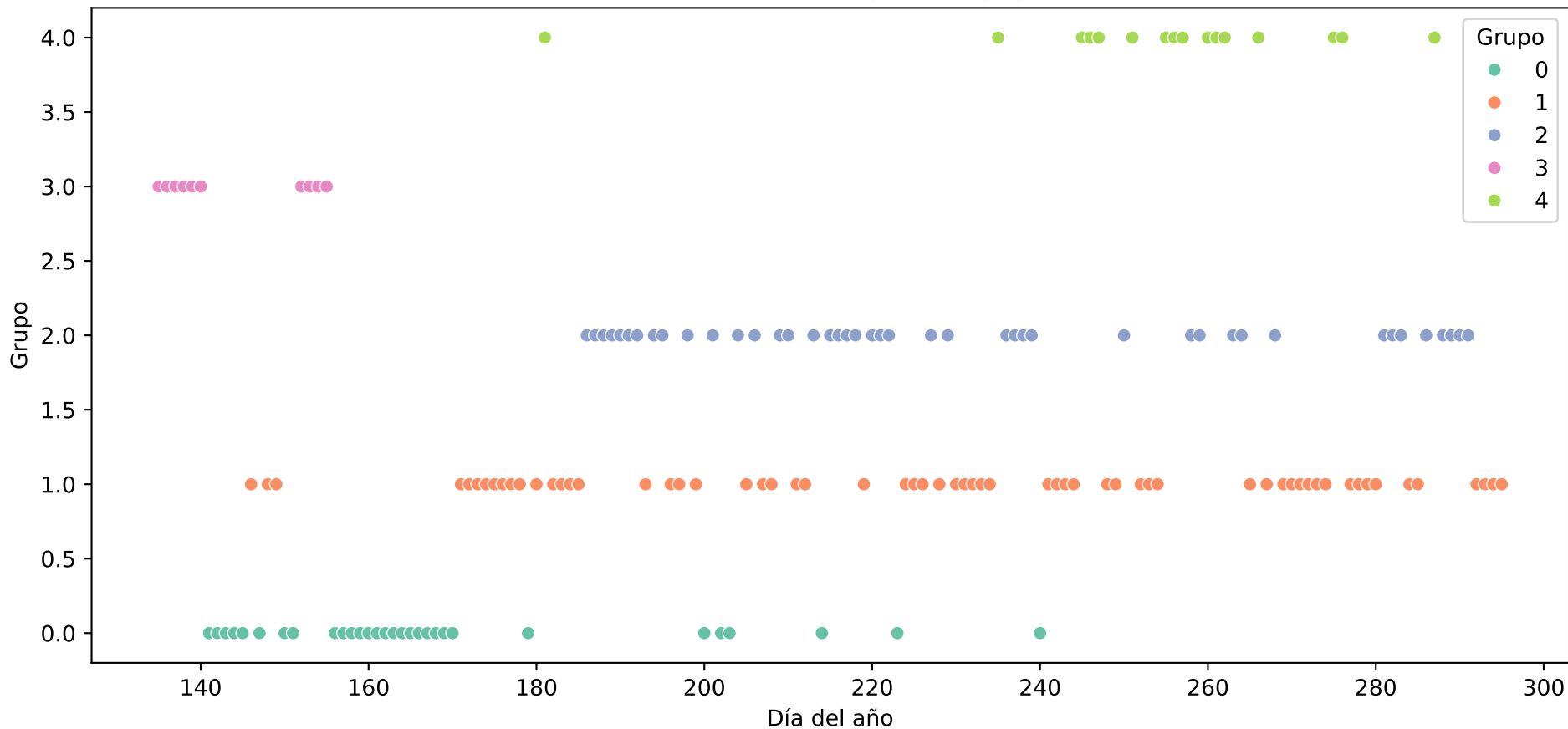
Método del codo



Clasificación de días climáticos — Zapopan (2014)

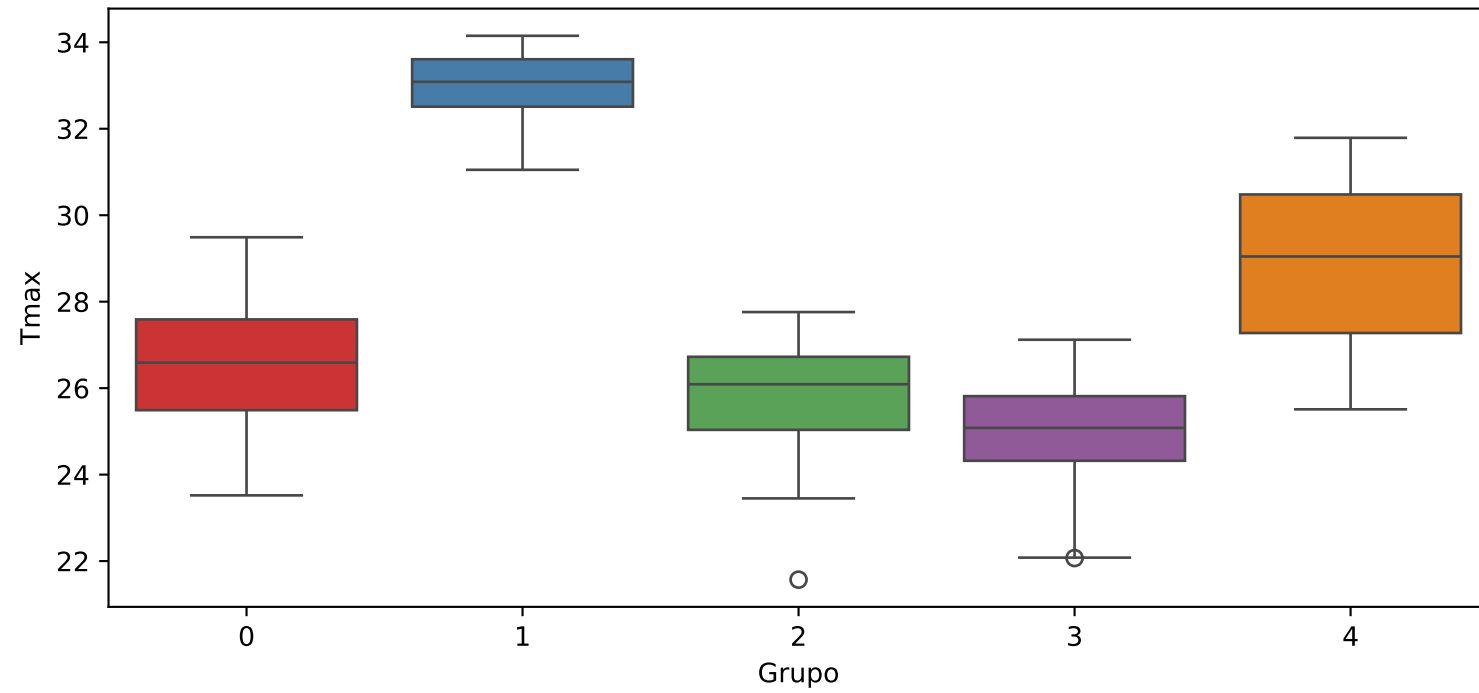


Distribución de días por grupo — Zapopan (2014)

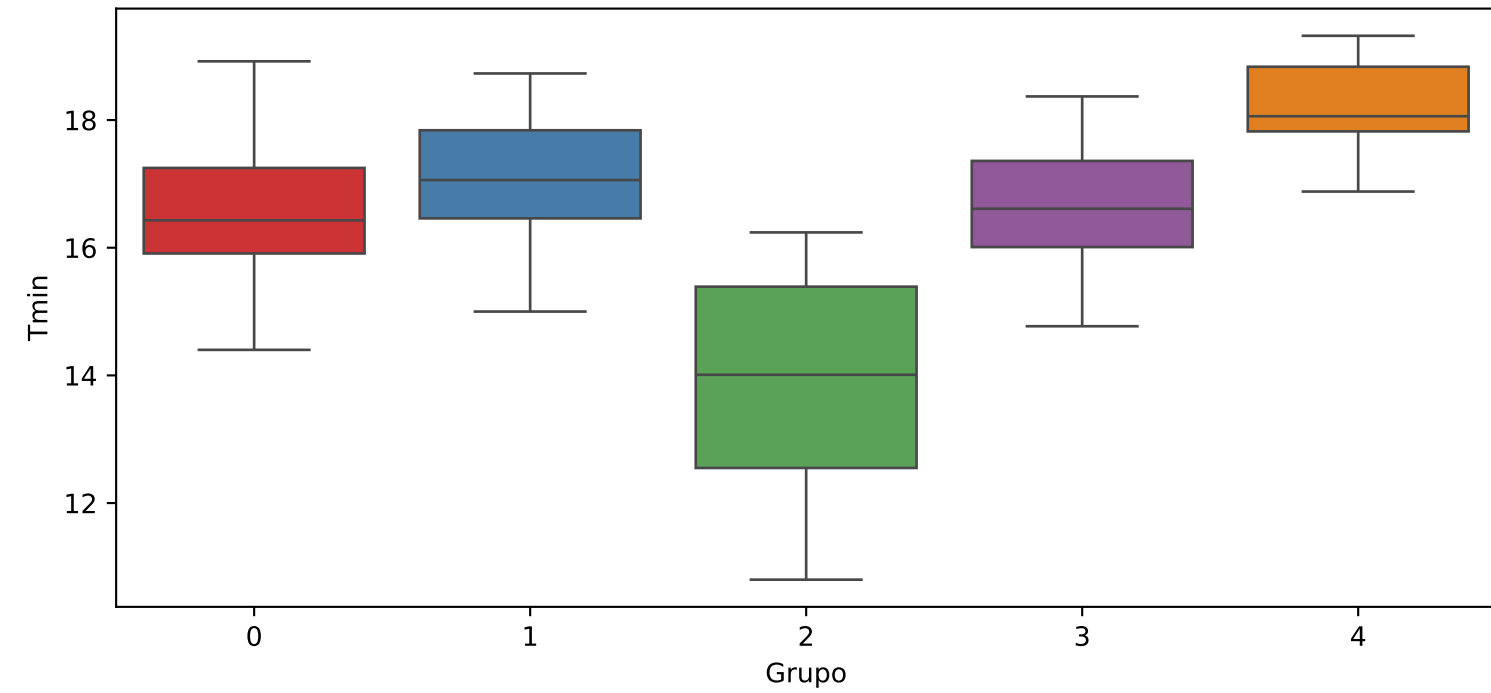


# Boxplots por grupo — Zapopan (2014)

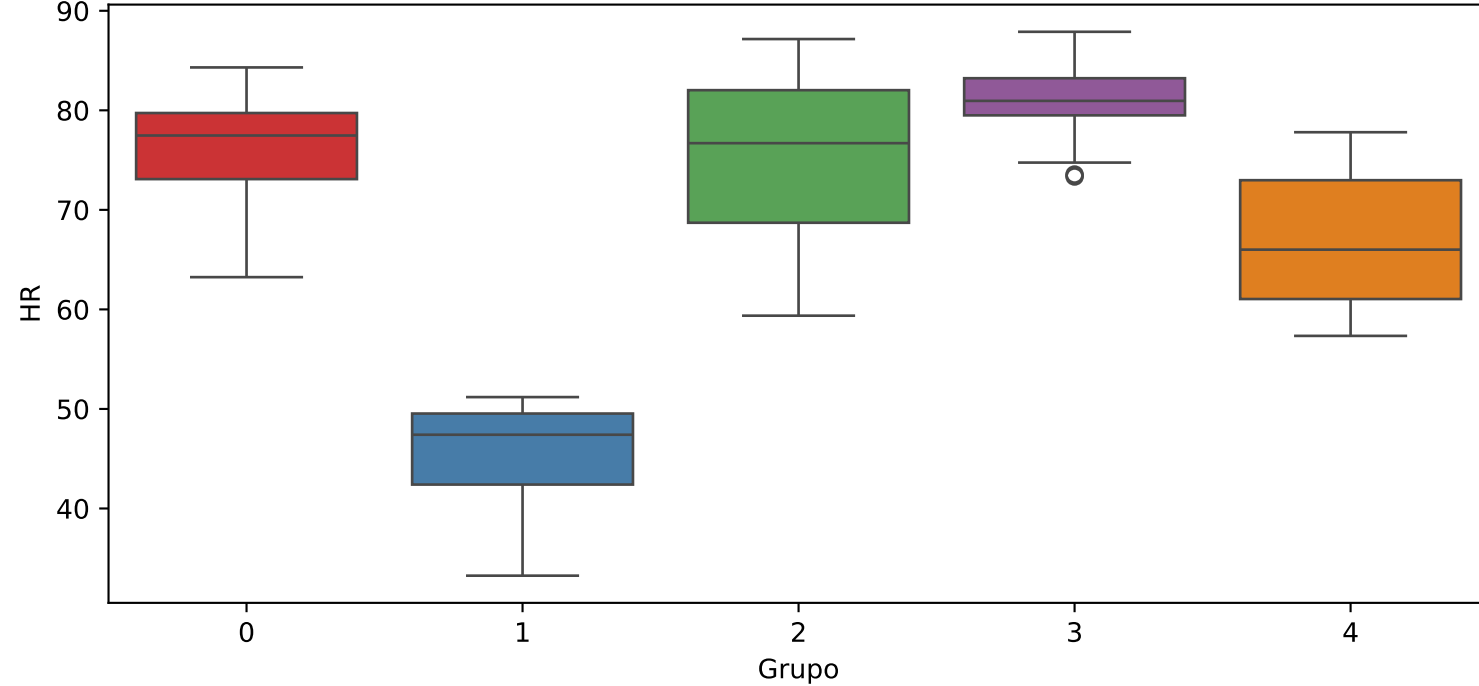
## Distribución de Tmax por grupo



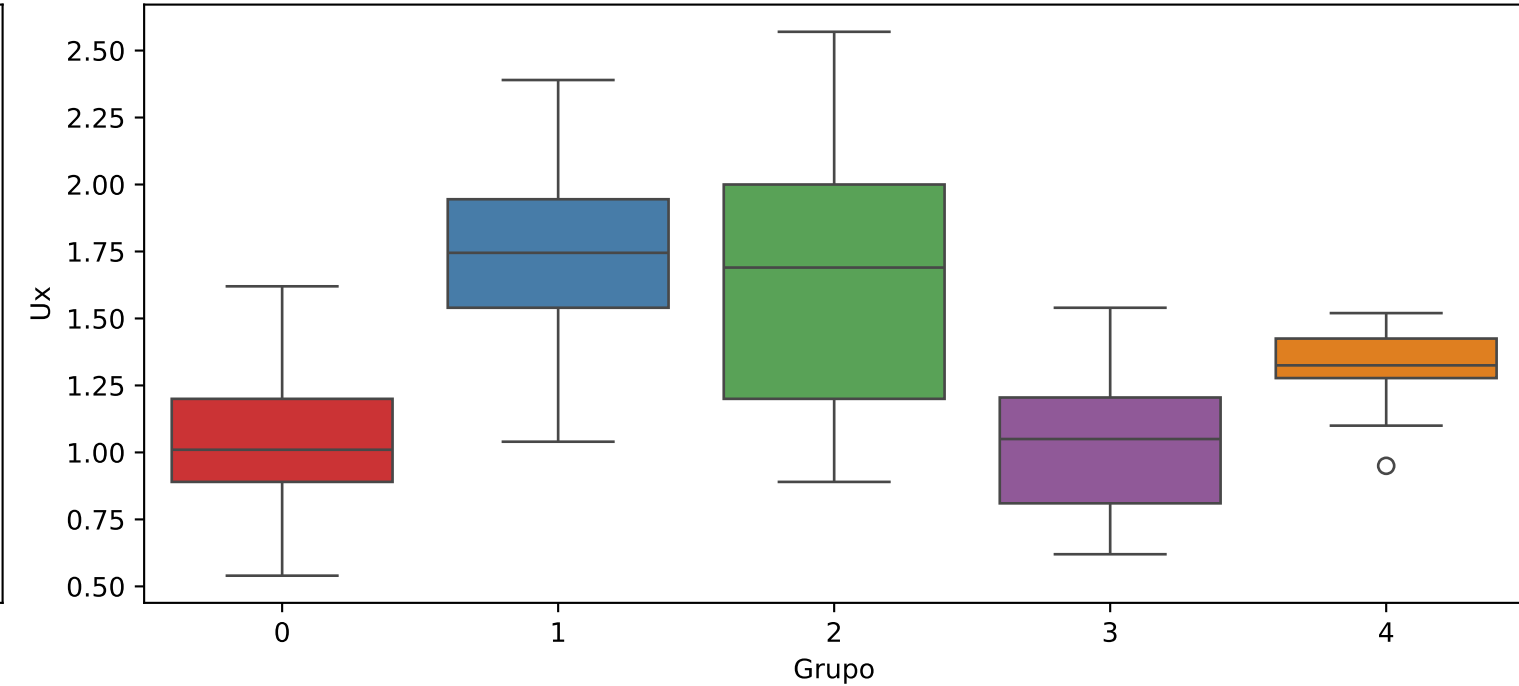
## Distribución de Tmin por grupo



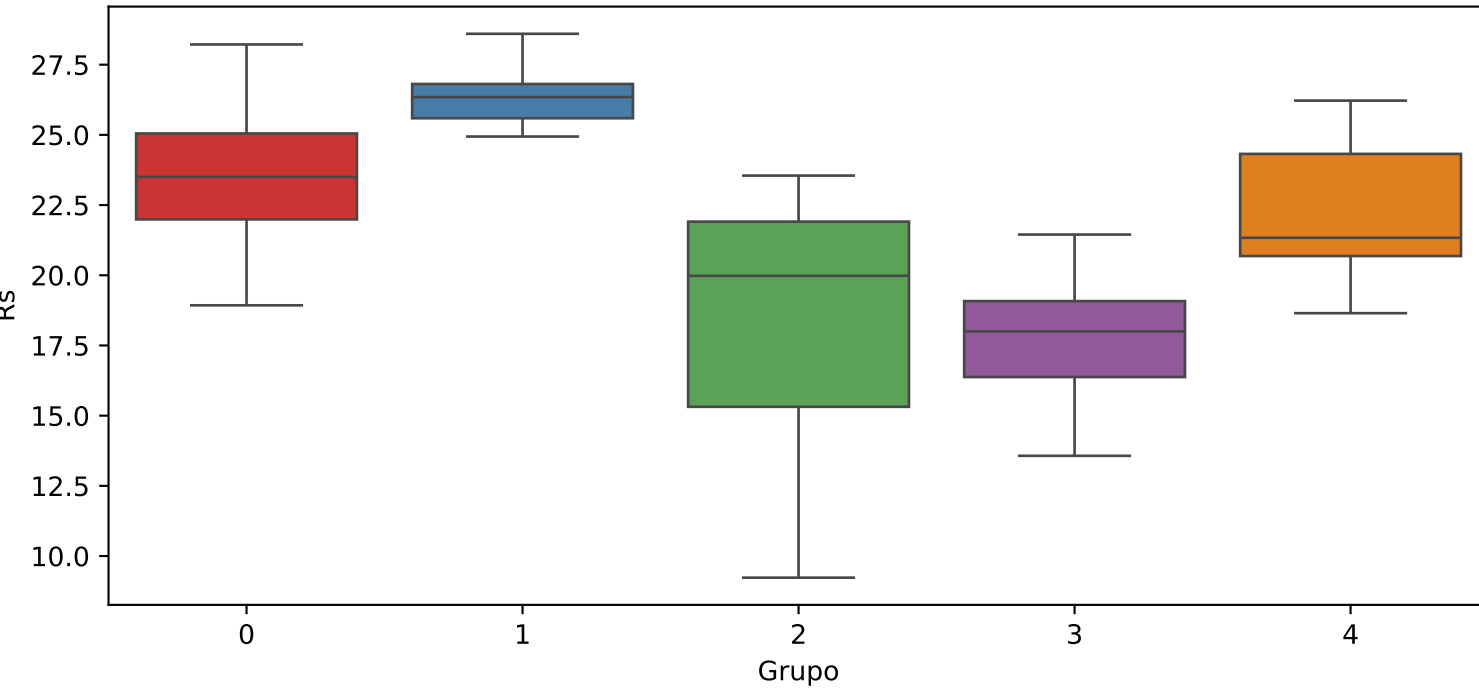
## Distribución de HR por grupo



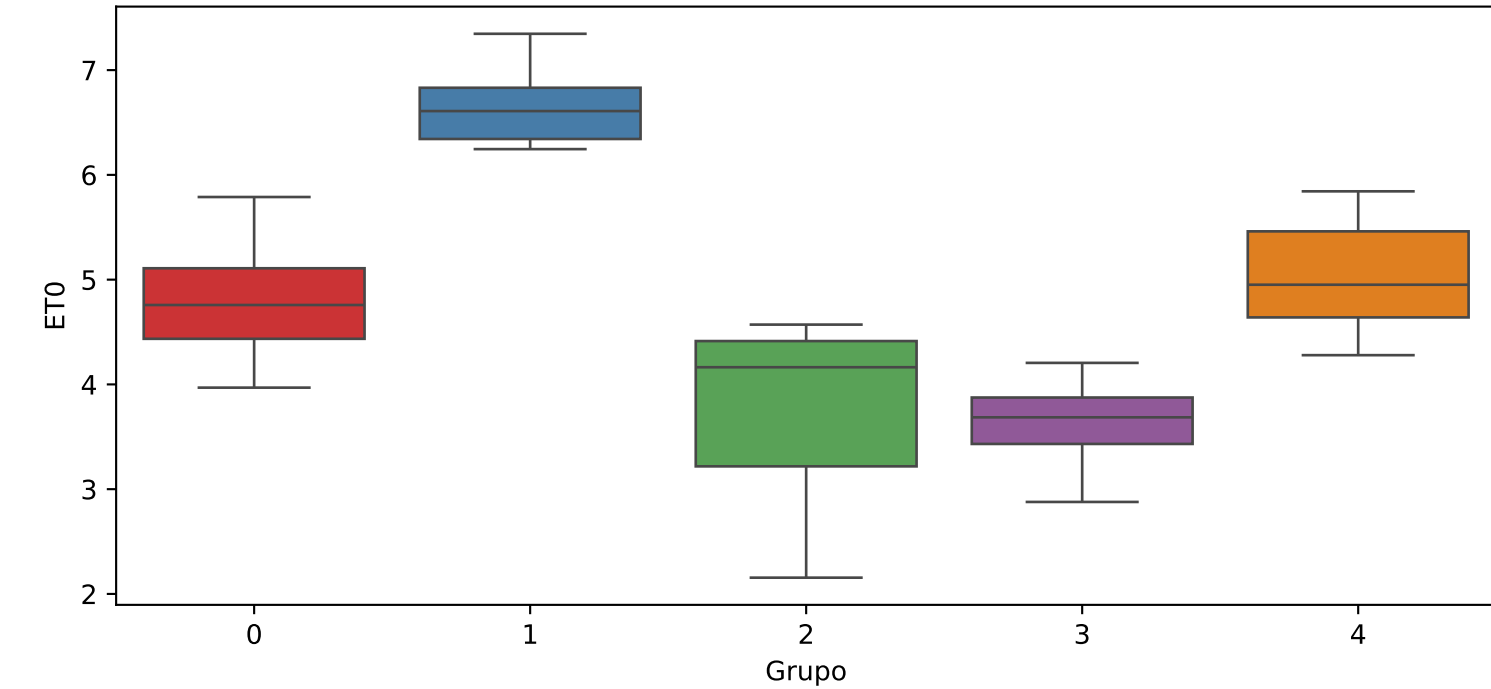
## Distribución de Ux por grupo



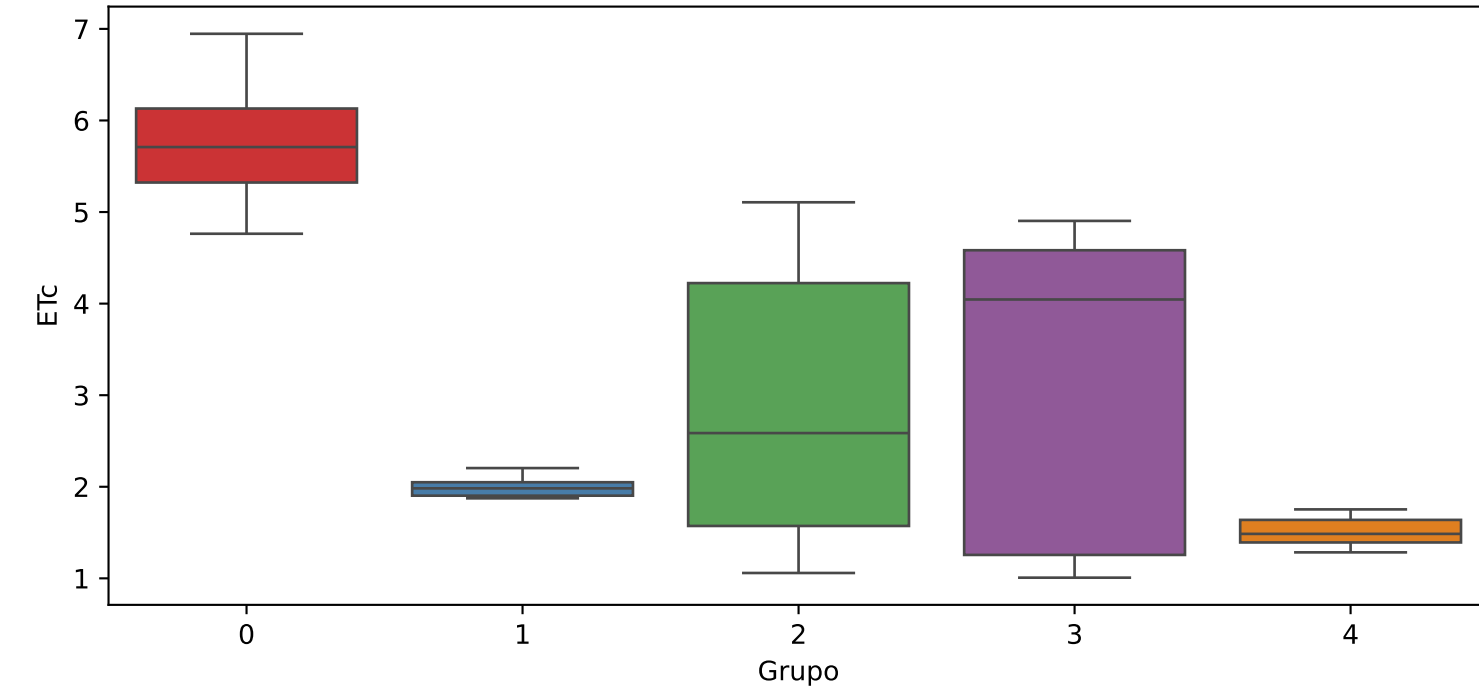
## Distribución de Rs por grupo



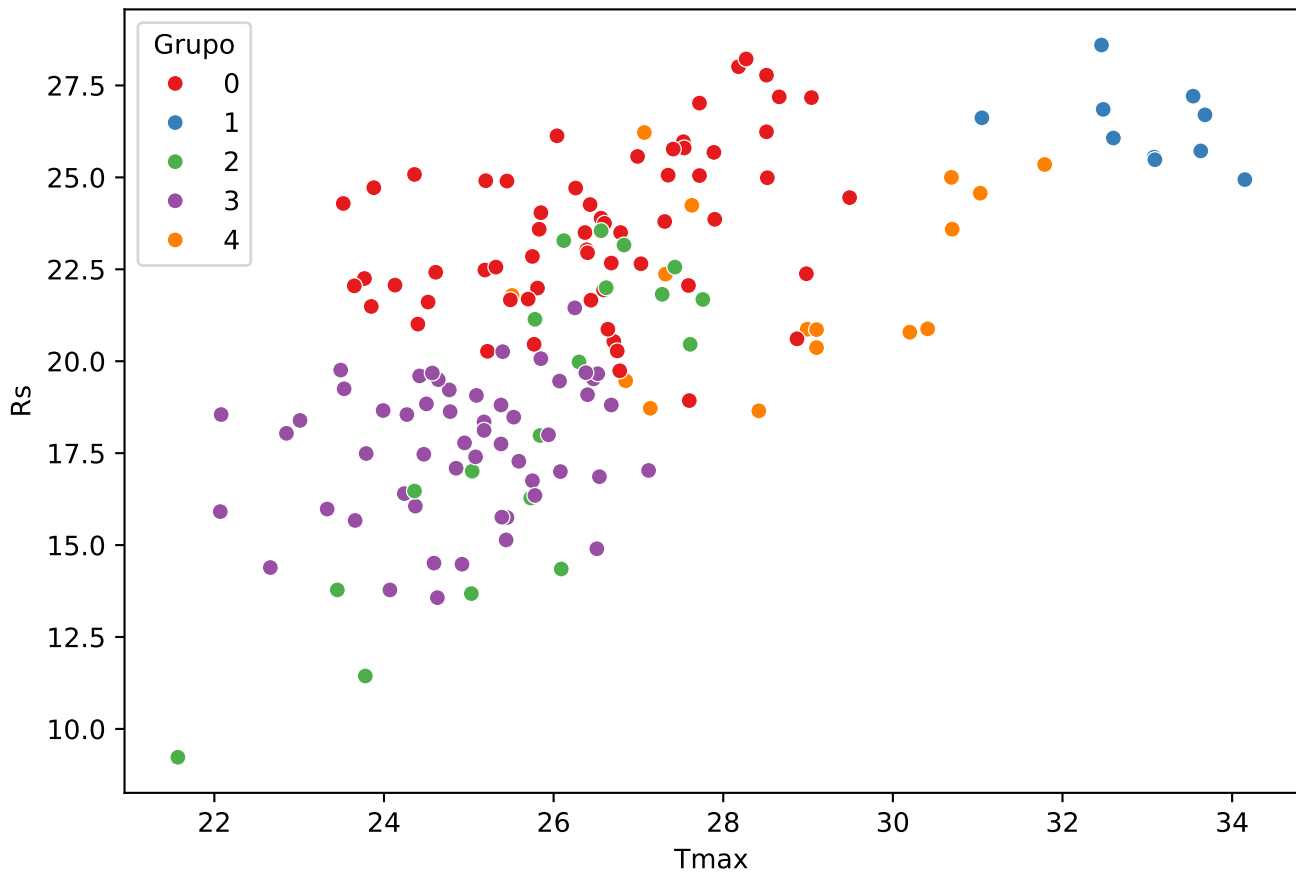
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2014)



## **Zapopan — 2015**

Días del ciclo: 161

ETc total [mm]: 654.0

ETverde total [mm]: 294.2

ETazul total [mm]: 359.8

Tmax / Tmin [°C]: 34.9 / 12.1

## Zapopan — 2015 · Resultados y métricas

[Zapopan 2015] Regresión Lineal ET0 —  $R^2$ : 0.9859 MSE: 0.0097

[Zapopan 2015] Random Forest ET0 —  $R^2$ : 0.9265 MSE: 0.0503

Importancias: {'Tmax': 0.16887385995560195, 'Tmin': 0.007741086622512866, 'HR': 0.06743208919684814, 'Ux': 0.007215036759572245, 'Rs': 0.7487379274654649}

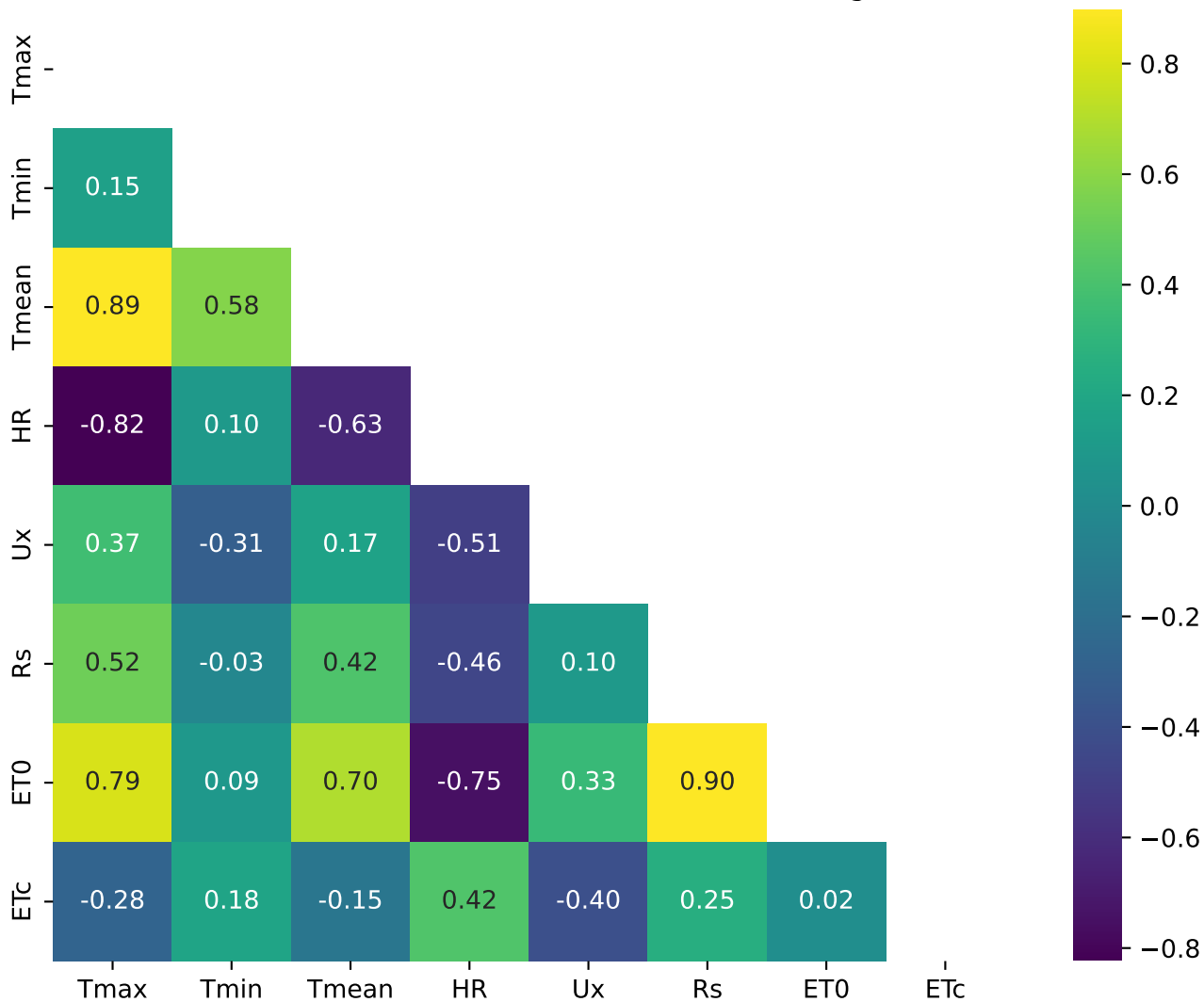
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	25.933654	17.178269	78.215385	1.055962	18.297115	3.893373	4.391227
1	27.587593	16.641296	72.195556	1.096111	24.244074	5.055538	6.066646
2	30.056000	17.827333	64.326000	1.434667	21.440000	5.034606	1.554972
3	32.694000	17.062000	49.607333	1.614667	25.809333	6.353906	1.906172
4	27.039600	14.585600	67.772800	1.454000	20.883600	4.399074	1.843913

**Zapopan — 2015**

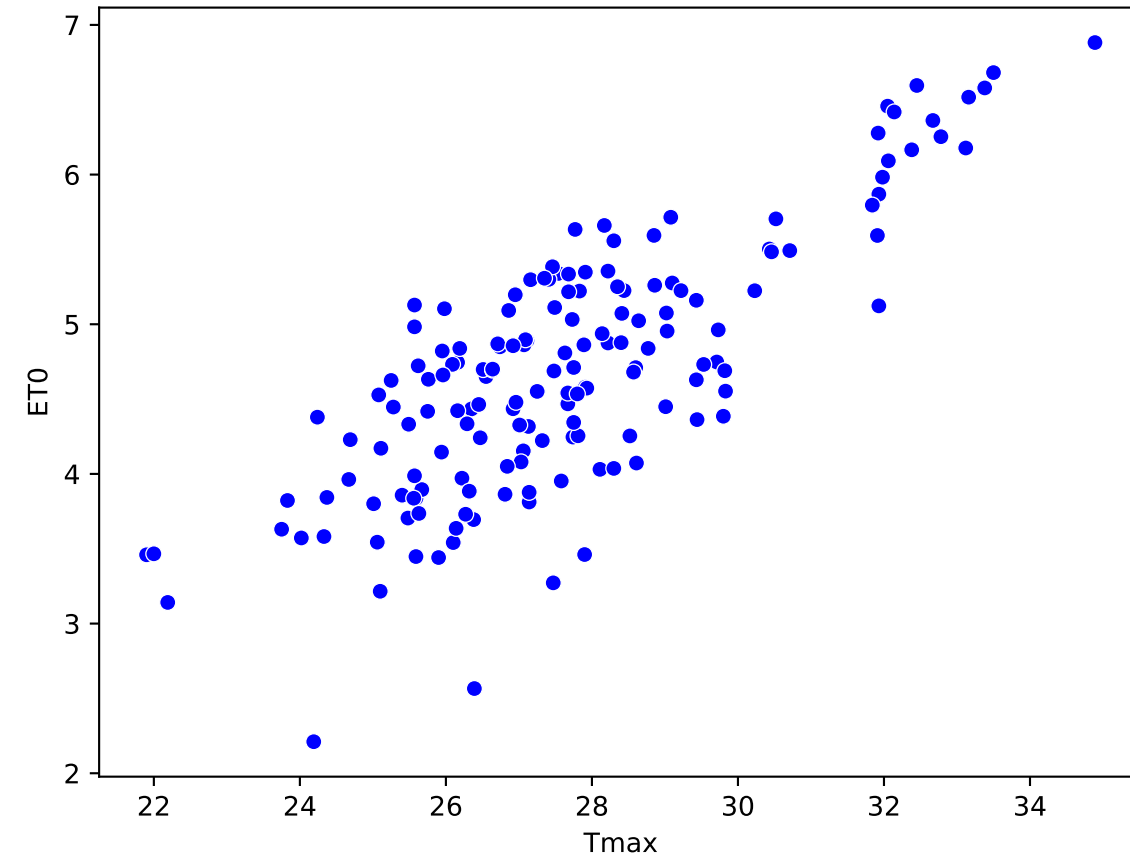


Matriz de Correlación entre Variables Meteorológicas

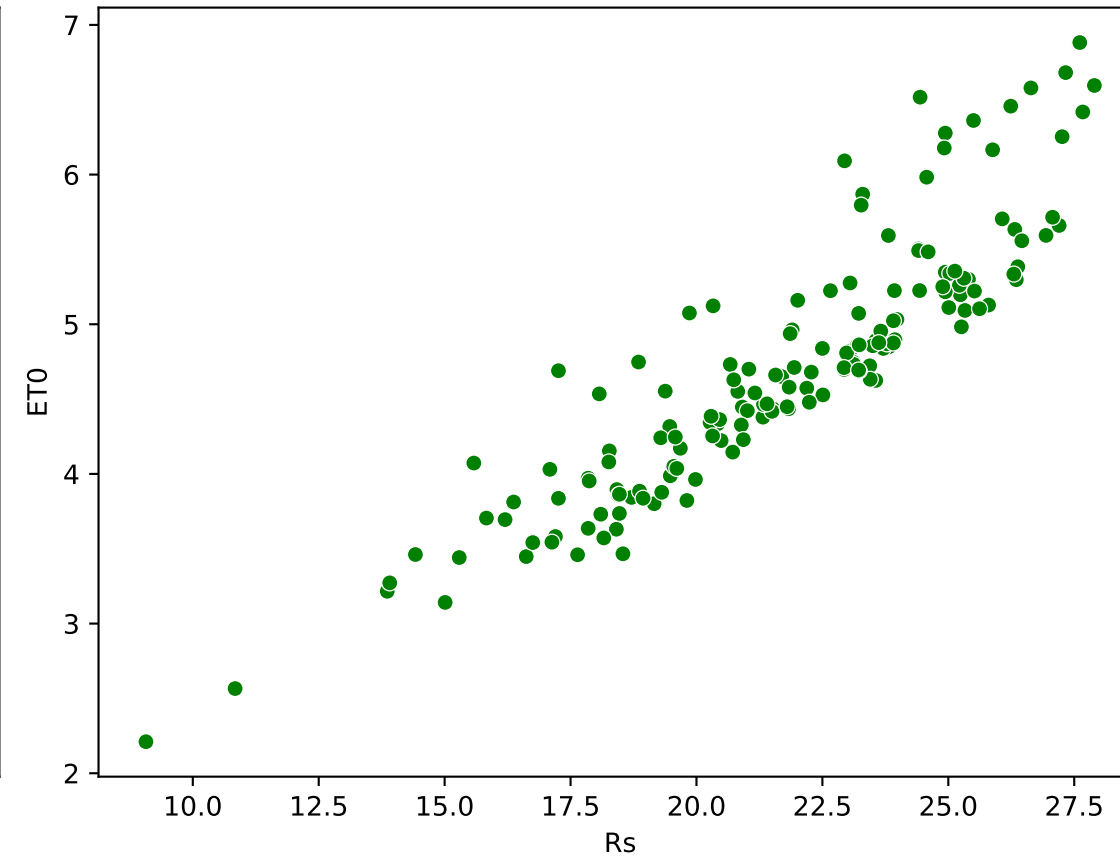


Dispersión — Zapopan (2015)

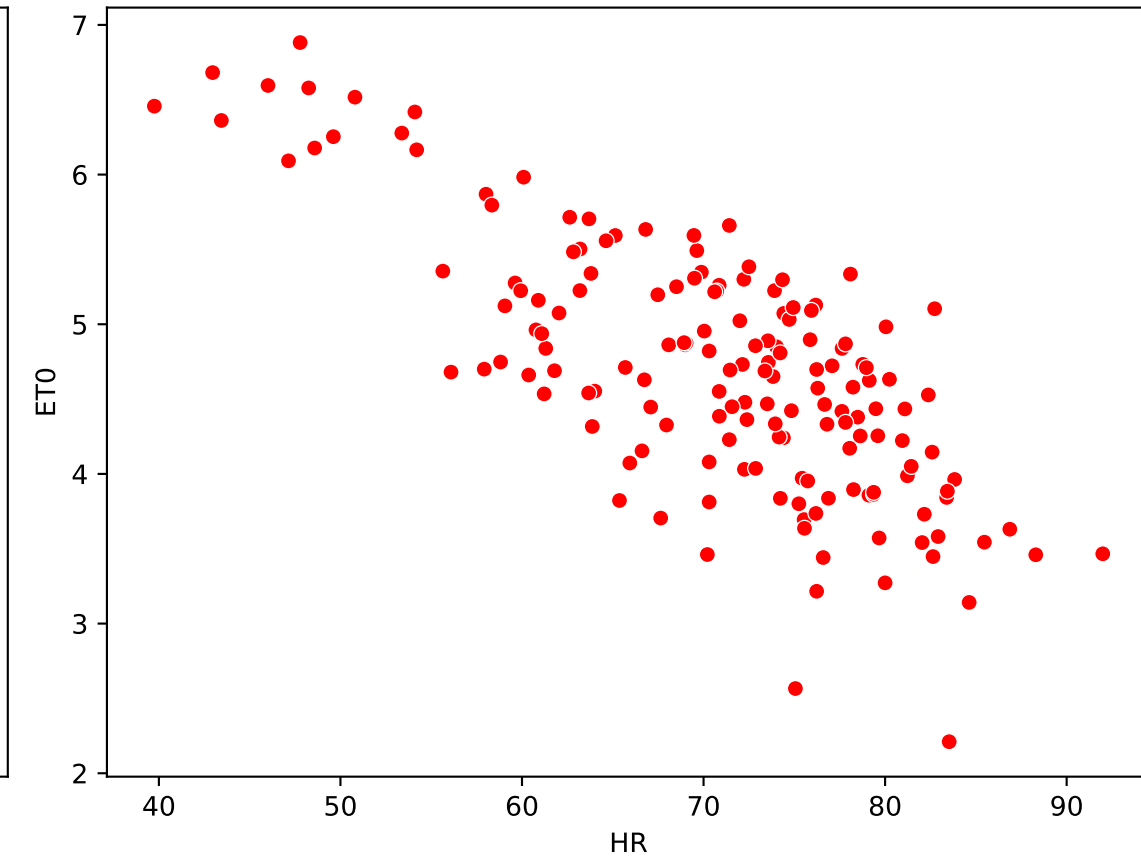
Tmax vs ET0



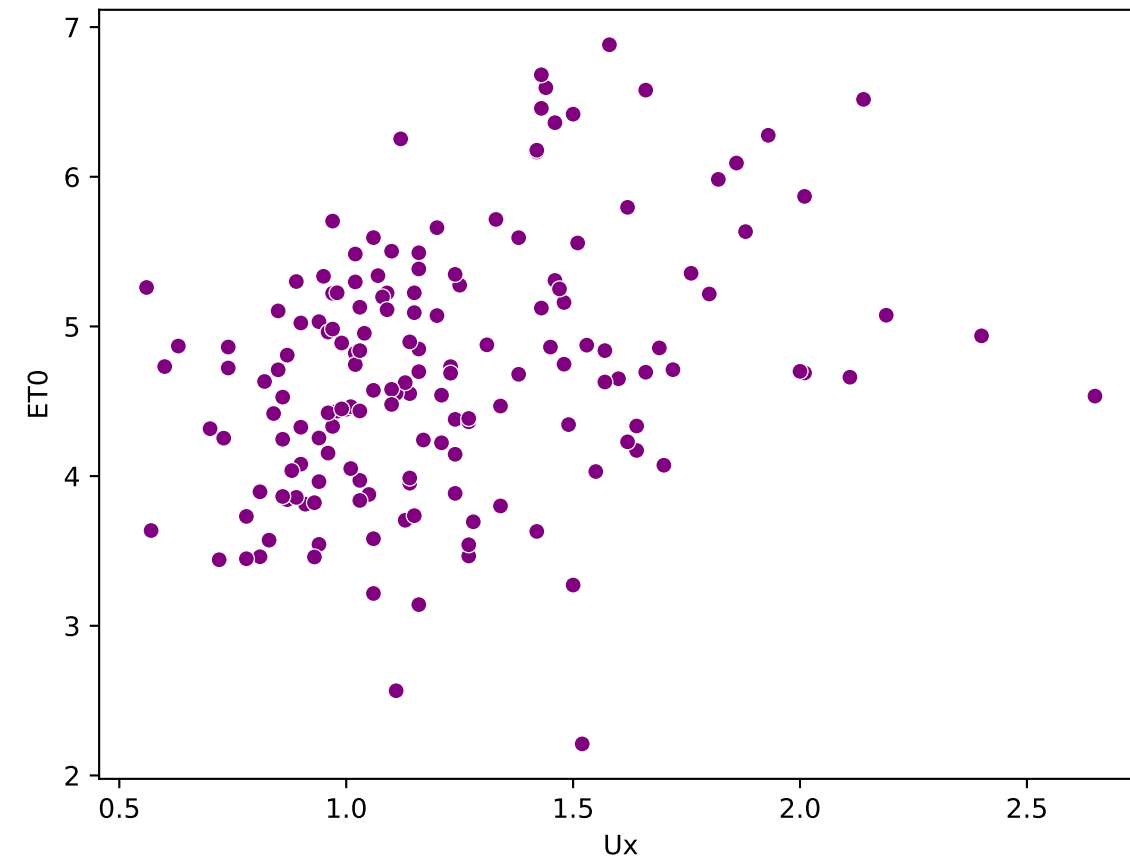
Rs vs ET0



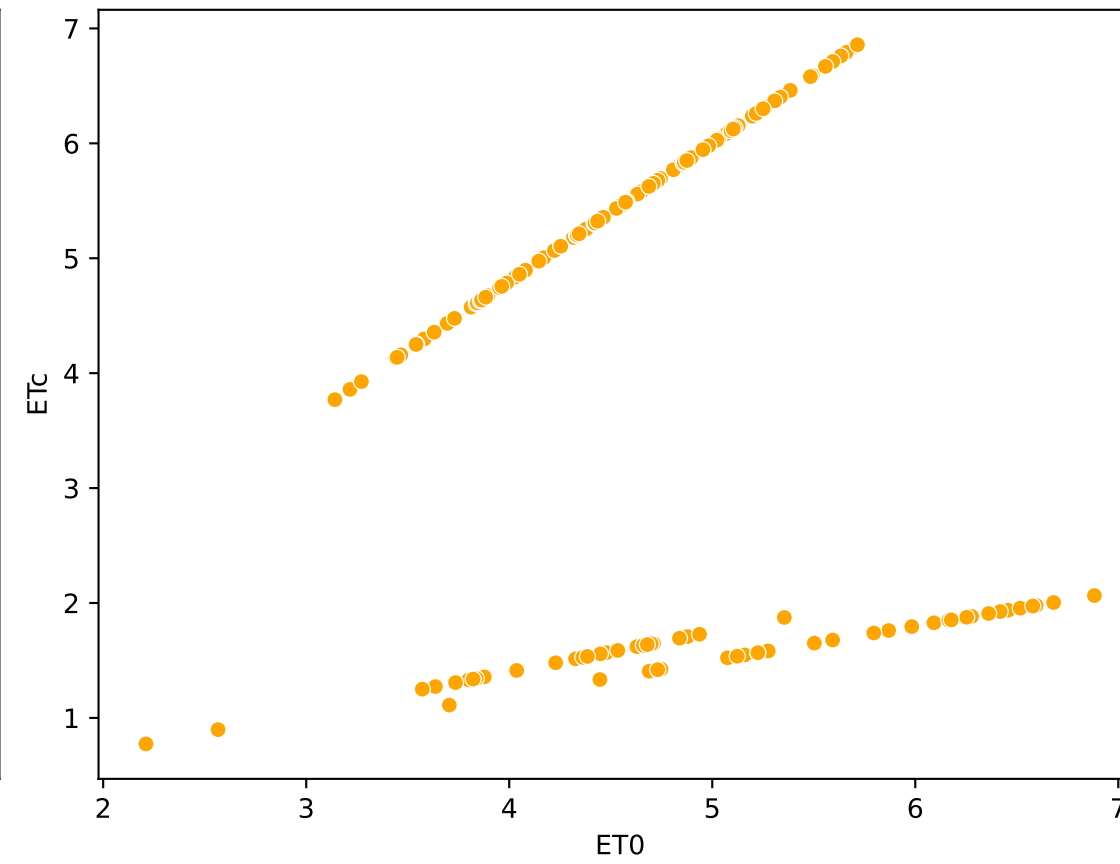
HR vs ET0



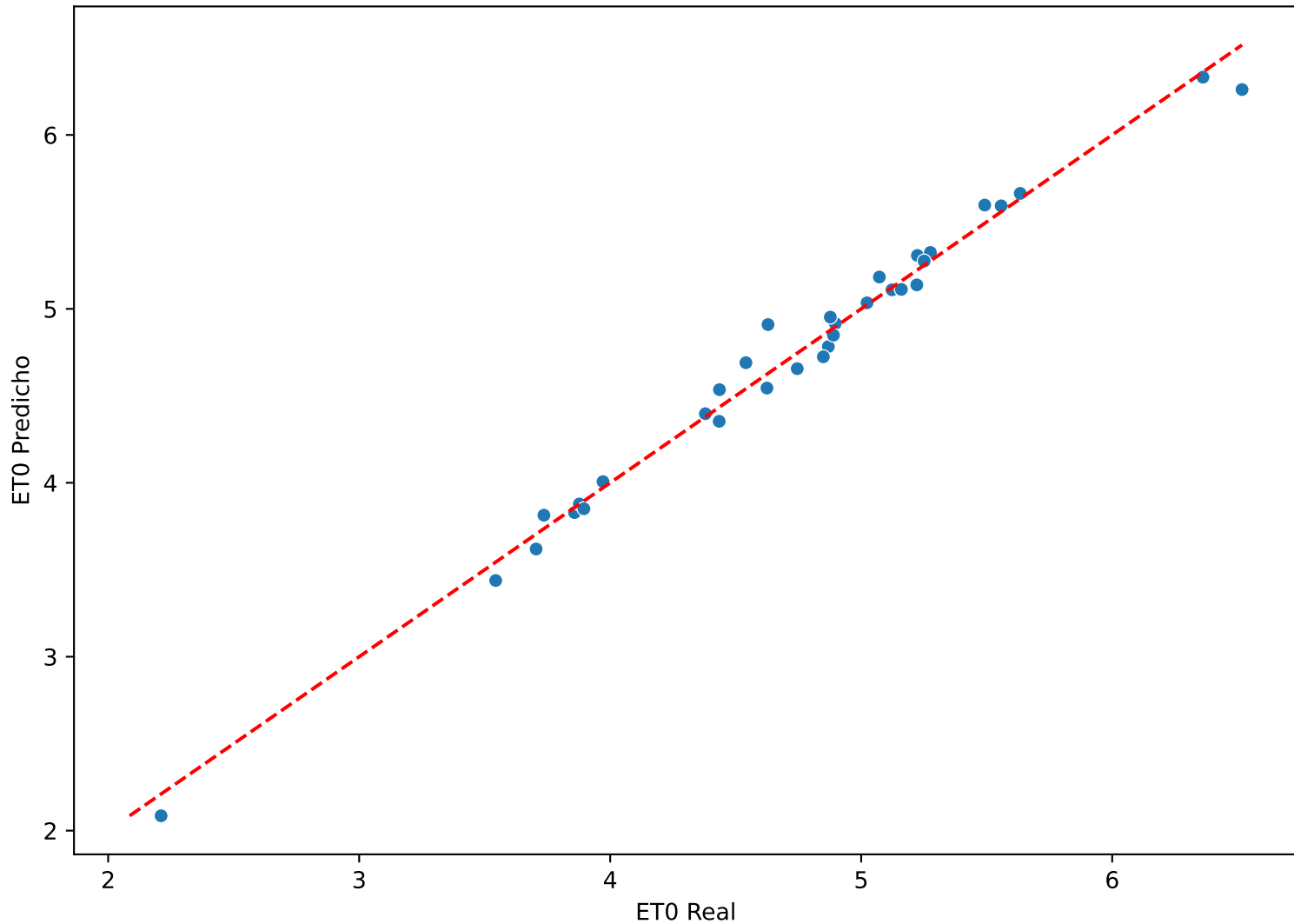
Ux vs ET0



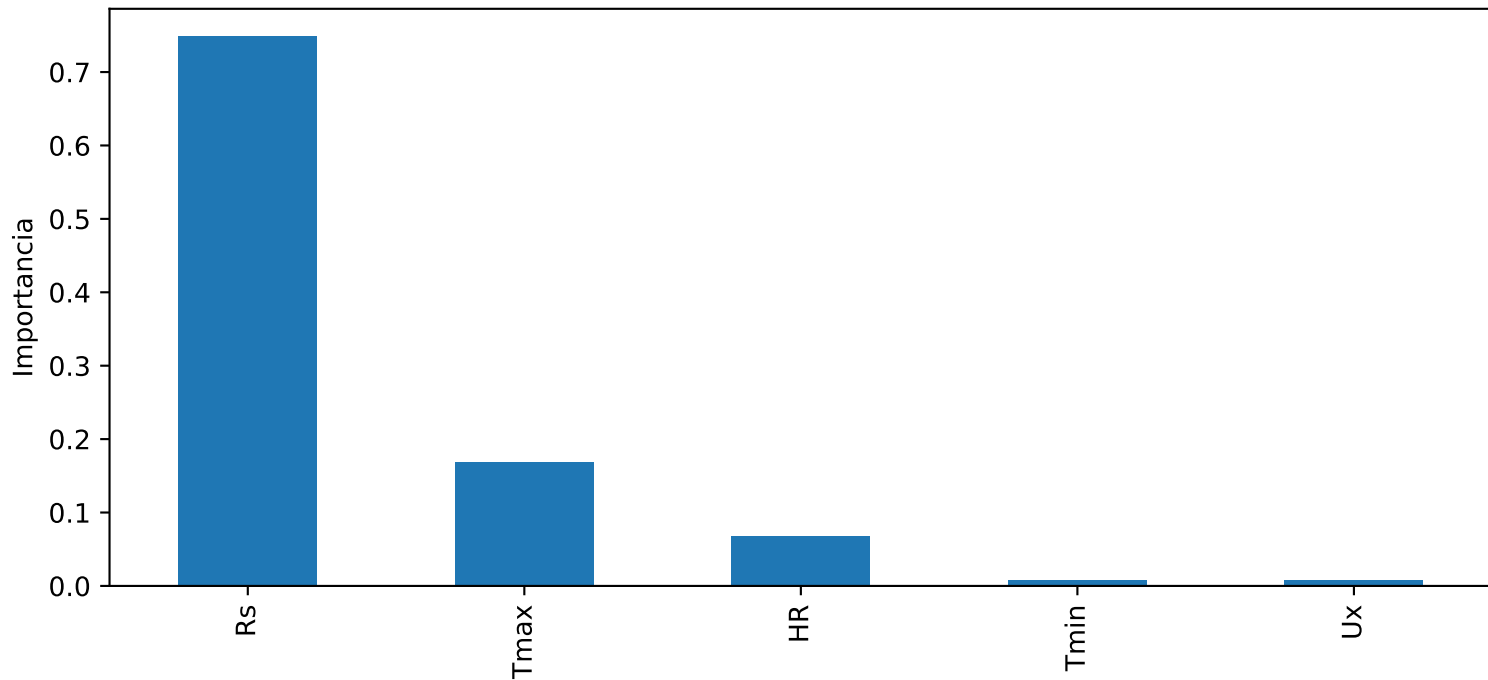
ET0 vs ETc



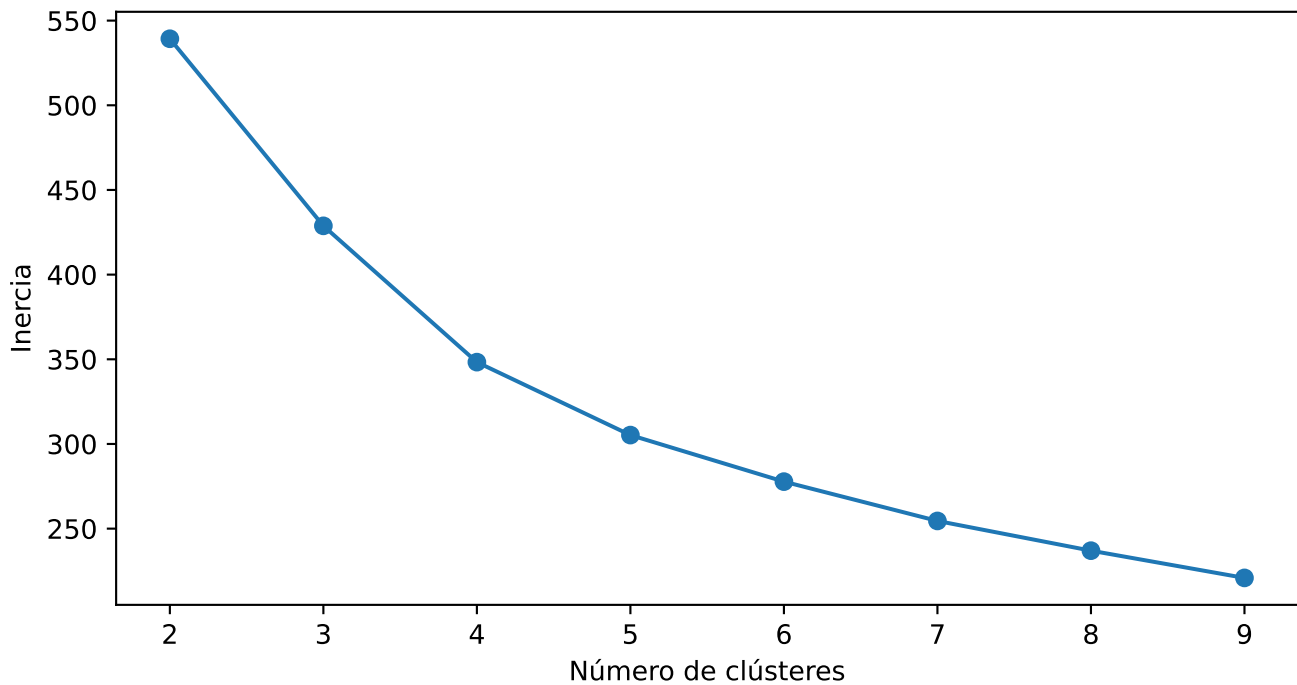
Comparación entre ET0 Real y Predicho — Zapopan (2015)



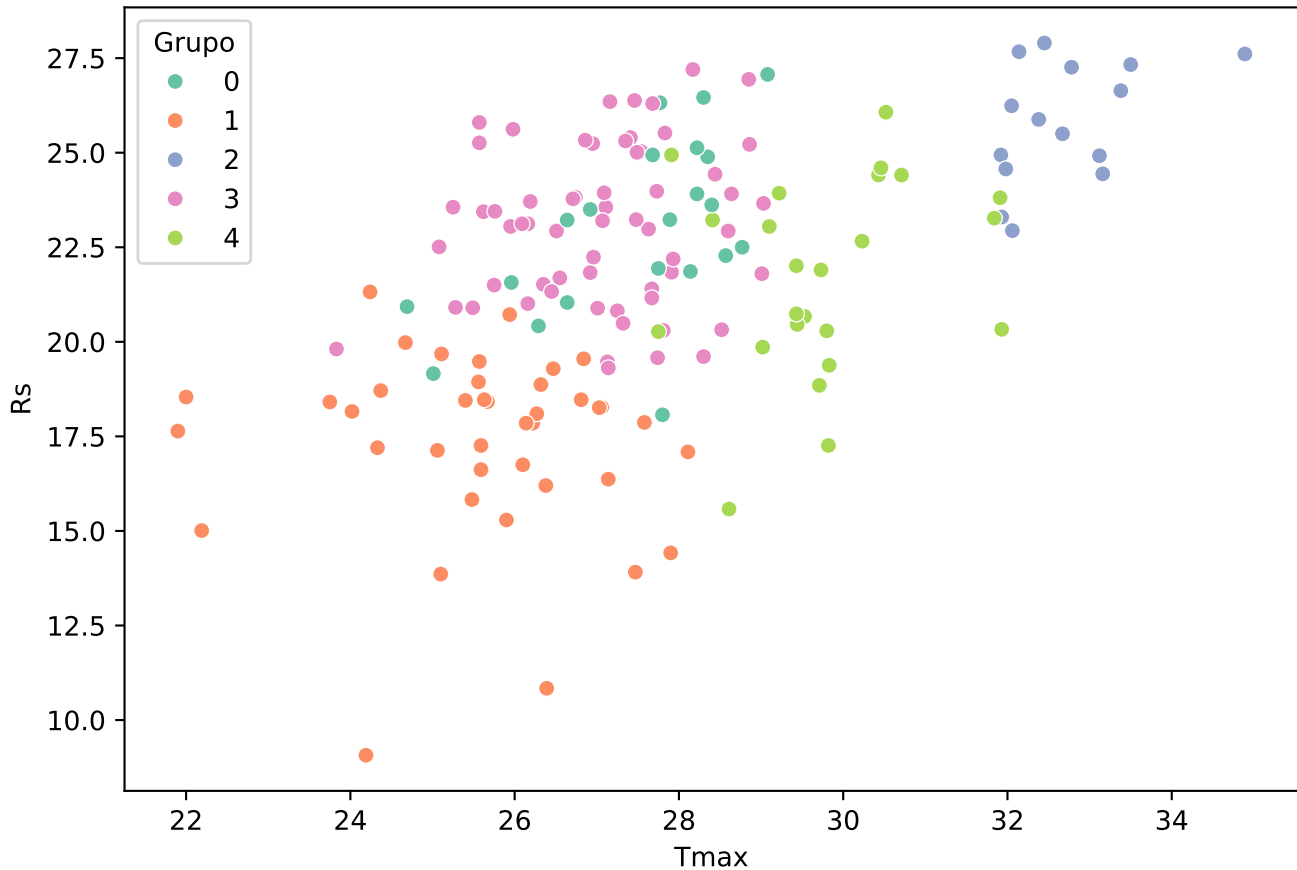
Importancia de variables (RF) — Zapopan (2015)



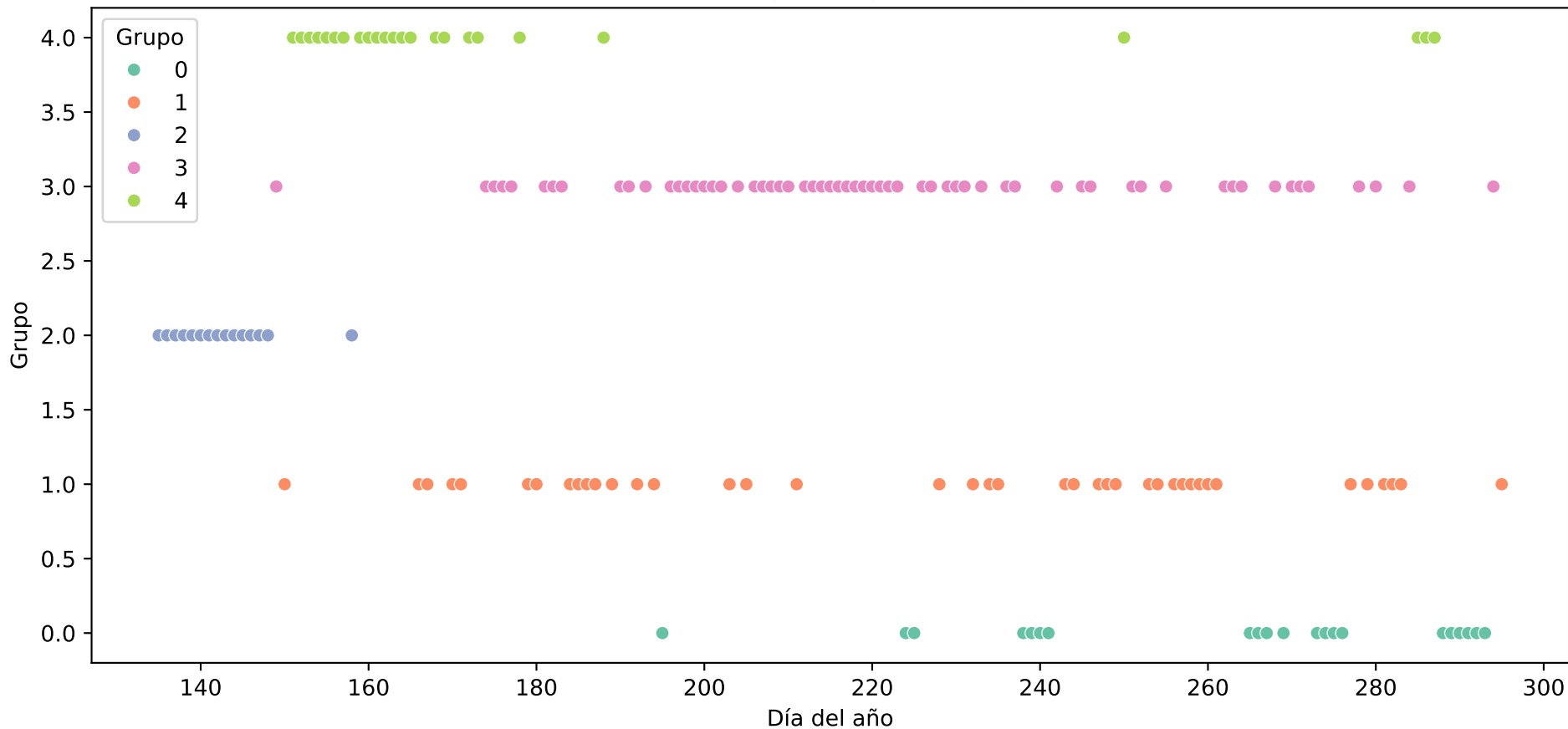
Método del codo



Clasificación de días climáticos — Zapopan (2015)

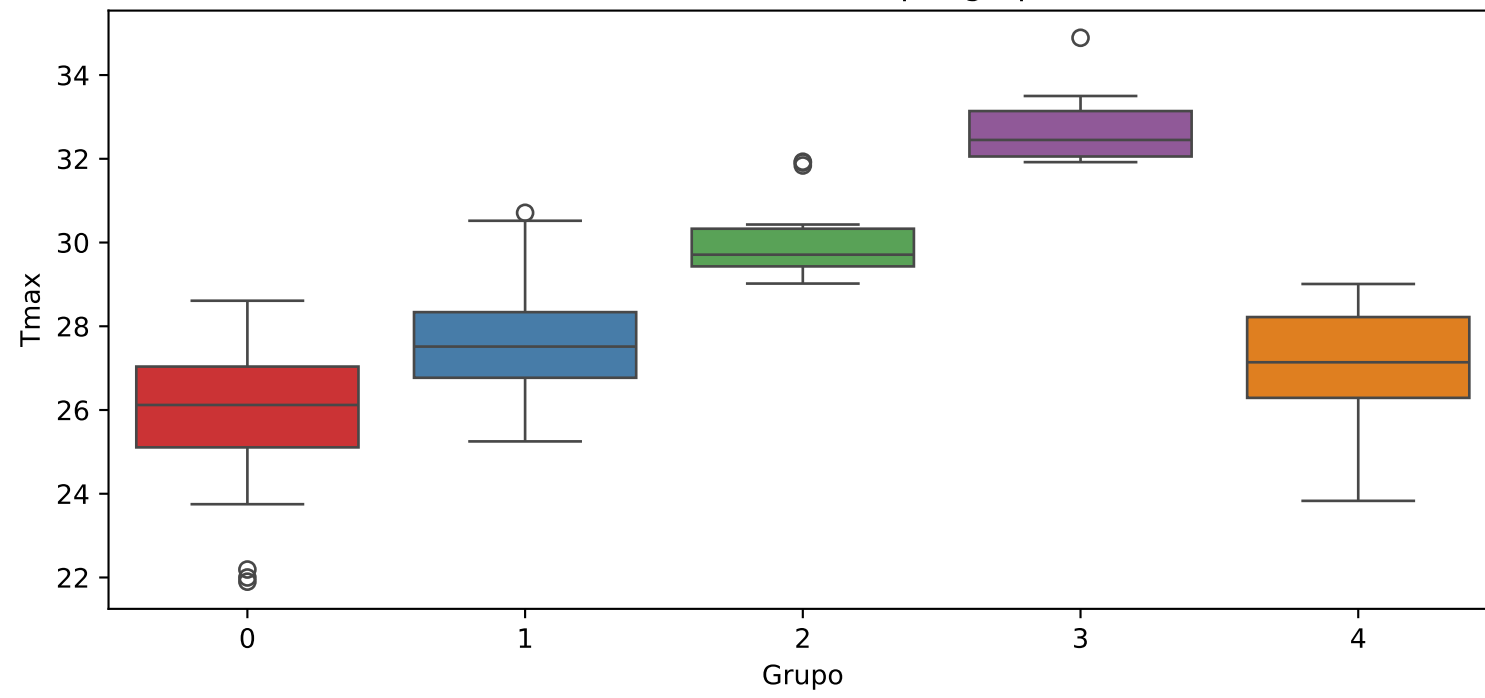


Distribución de días por grupo — Zapopan (2015)

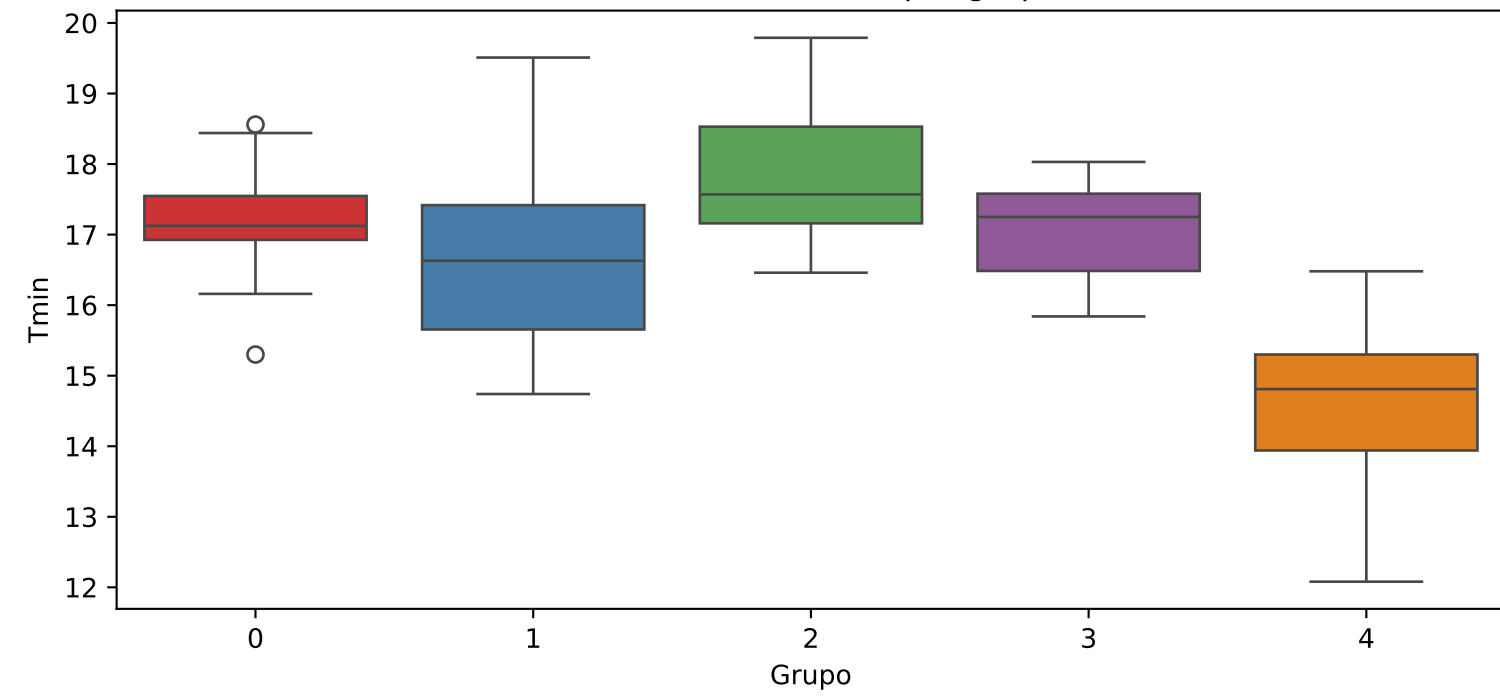


# Boxplots por grupo — Zapopan (2015)

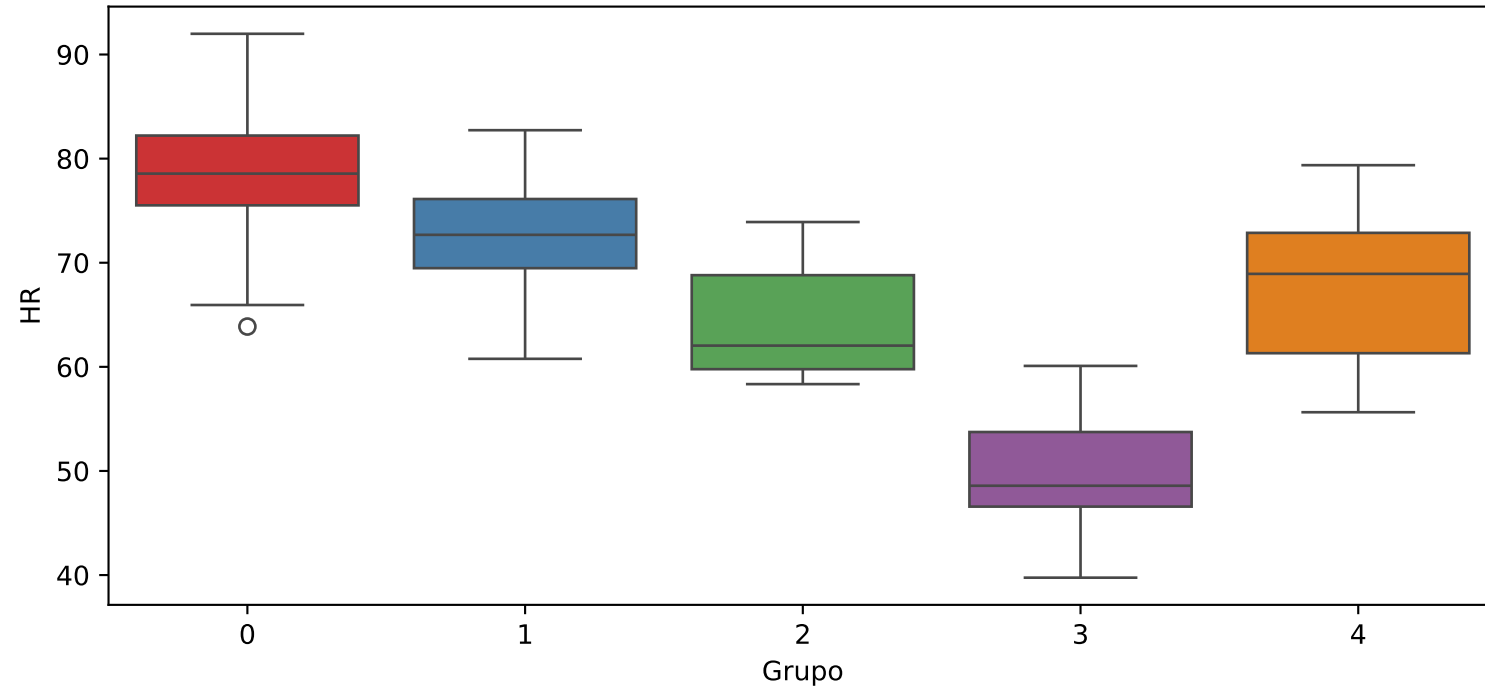
## Distribución de Tmax por grupo



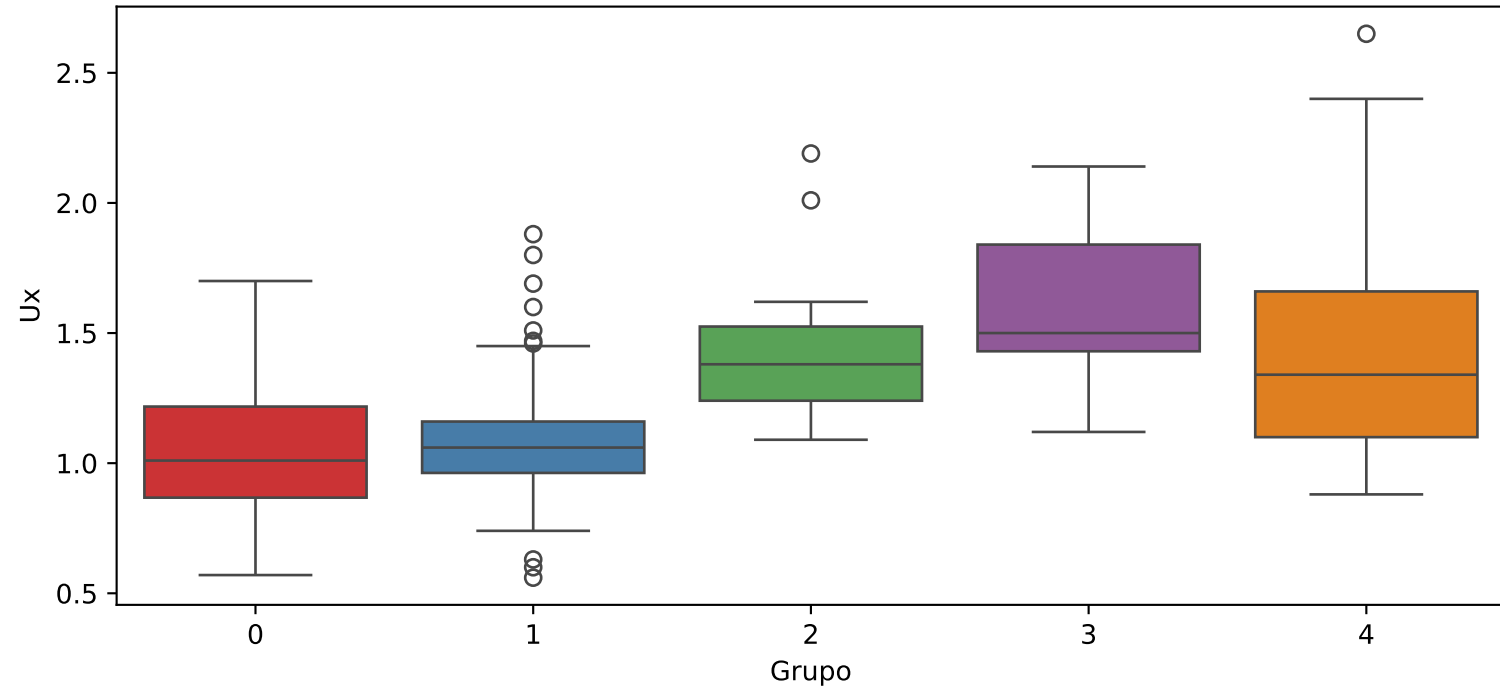
## Distribución de Tmin por grupo



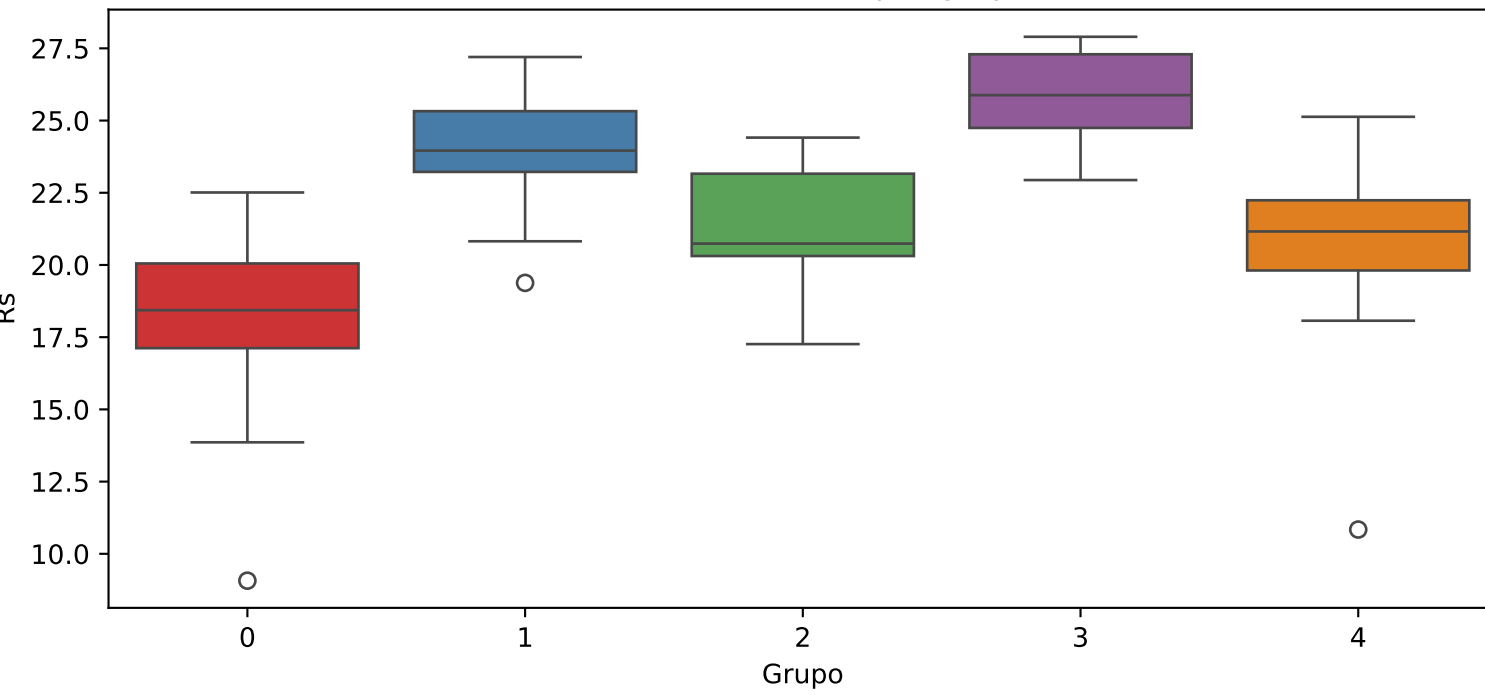
## Distribución de HR por grupo



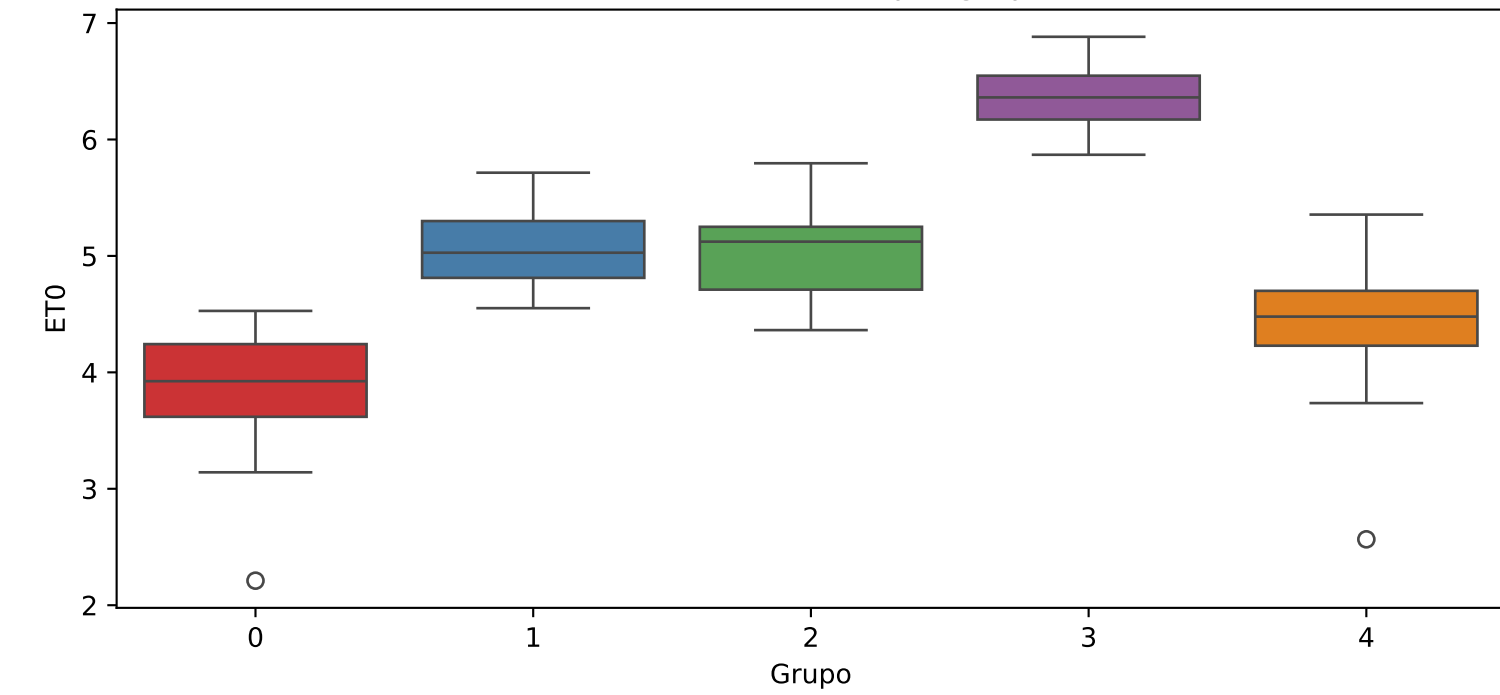
## Distribución de Ux por grupo



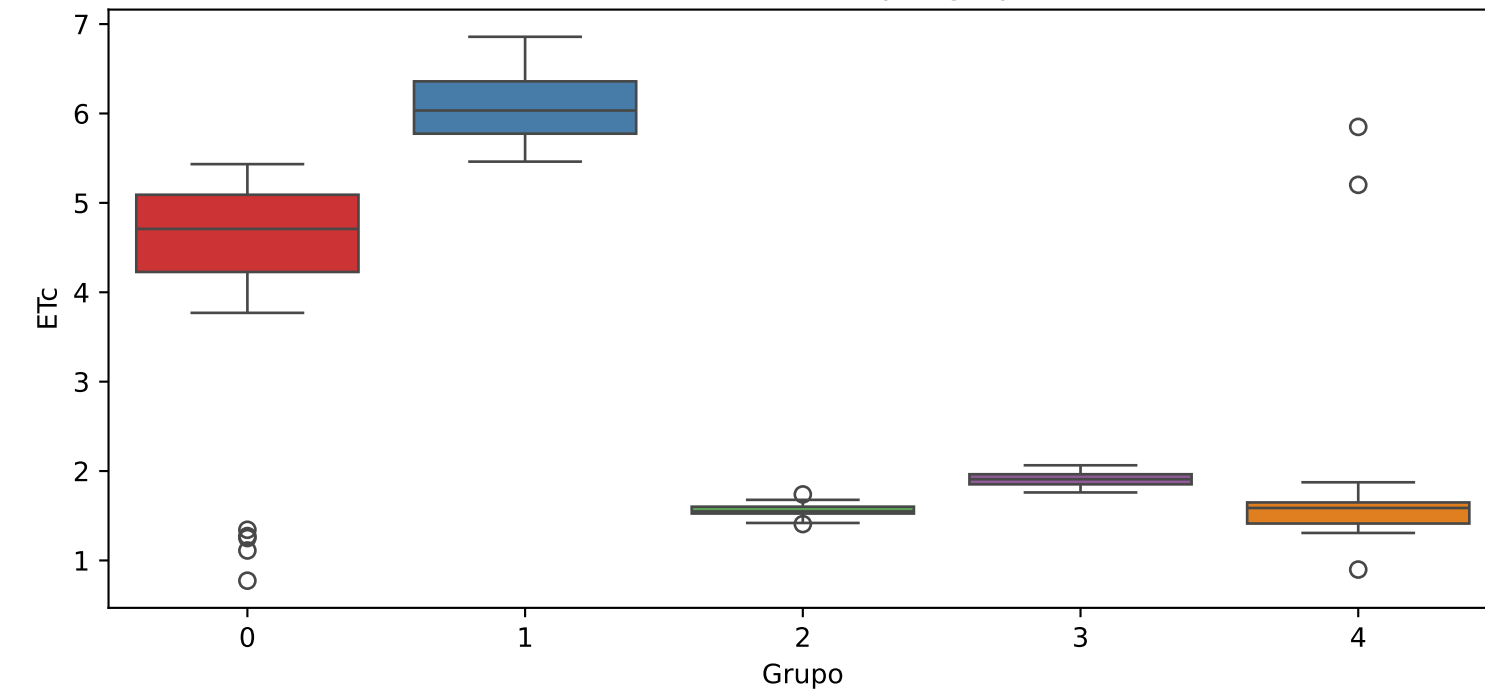
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

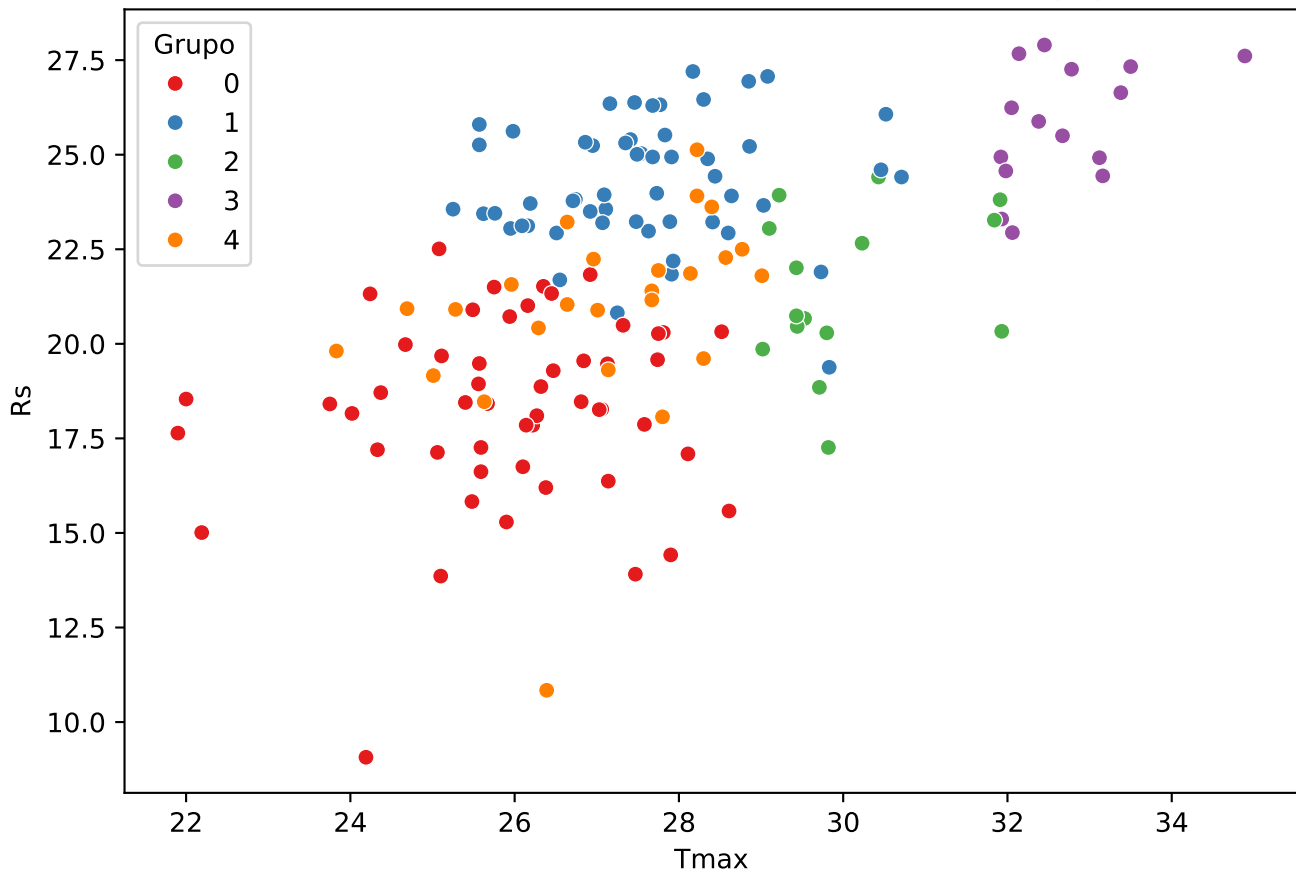


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2015)



## **Zapopan — 2016**

Días del ciclo: 161

ETc total [mm]: 634.9

ETverde total [mm]: 338.3

ETazul total [mm]: 296.5

Tmax / Tmin [°C]: 37.4 / 11.1

## Zapopan — 2016 · Resultados y métricas

[Zapopan 2016] Regresión Lineal ET0 —  $R^2$ : 0.9907 MSE: 0.0162

[Zapopan 2016] Random Forest ET0 —  $R^2$ : 0.9900 MSE: 0.0174

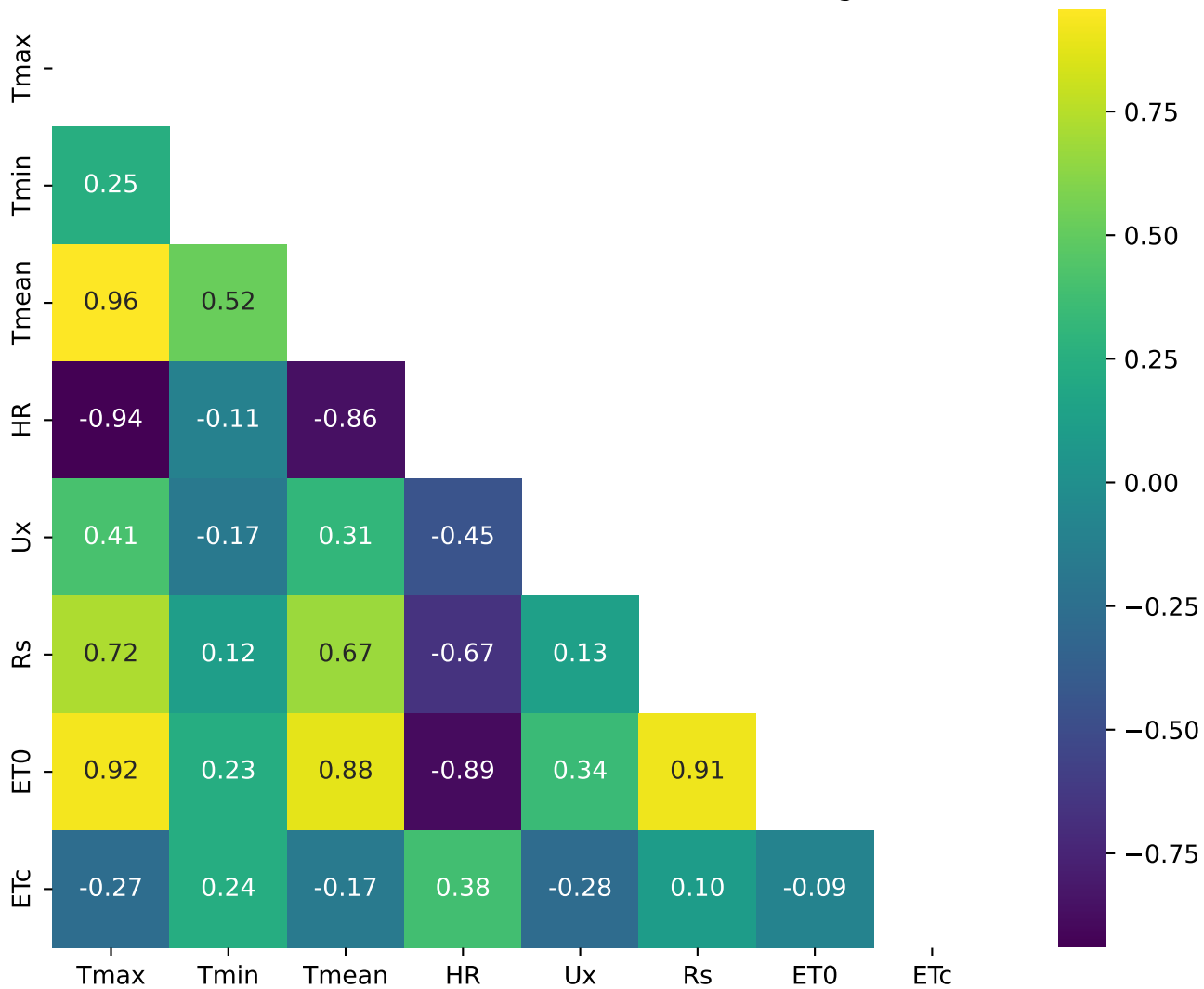
Importancias: {'Tmax': 0.4331990905997062, 'Tmin': 0.003951298332373441, 'HR': 0.2282872726497163, 'Ux': 0.0060704373271167076, 'Rs': 0.3284919010910872}

Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.951270	16.962381	76.700952	1.042222	22.840317	4.734134	5.680961
1	34.596071	17.143929	43.430714	1.608929	26.629286	6.799304	2.039791
2	25.337674	16.783256	81.020000	0.935814	17.690000	3.661985	3.210520
3	26.000526	14.236316	74.975789	1.271579	21.452105	4.239692	3.057361
4	25.328750	15.650000	77.815000	2.201250	15.010000	3.389989	2.963570

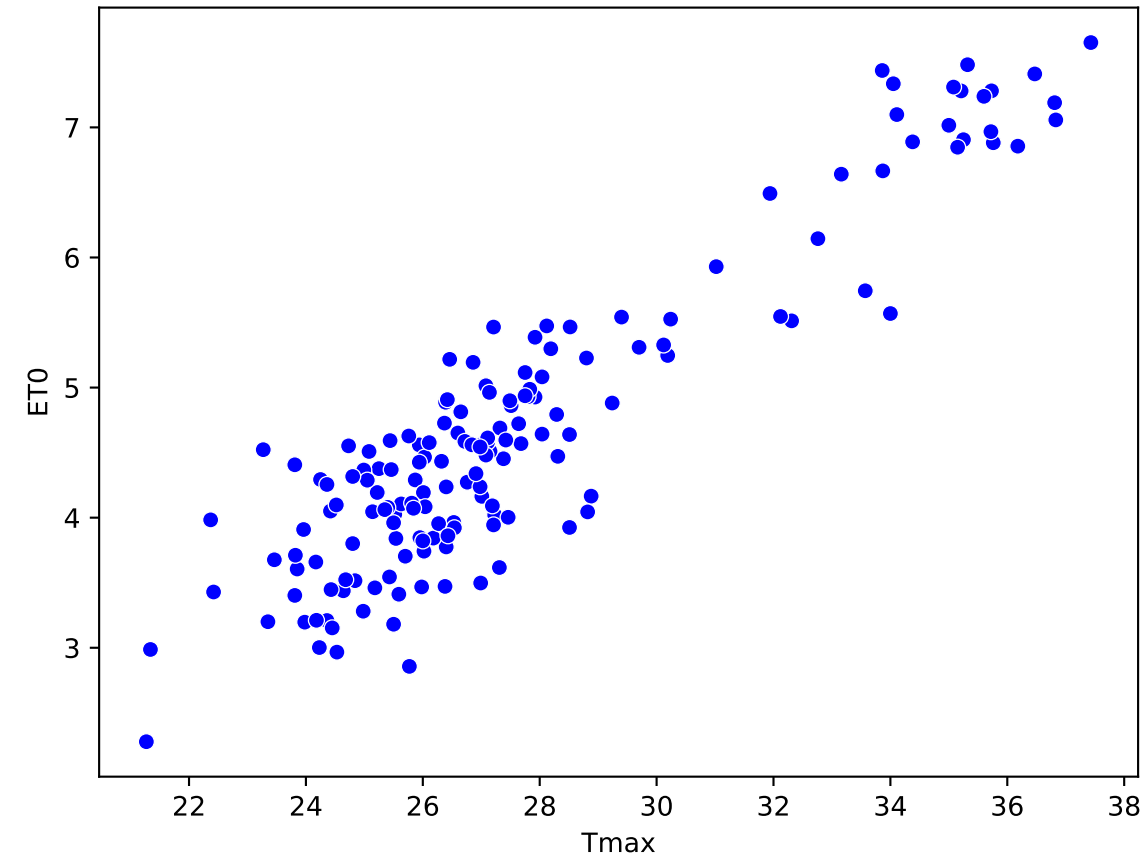
**Zapopan — 2016**

Matriz de Correlación entre Variables Meteorológicas

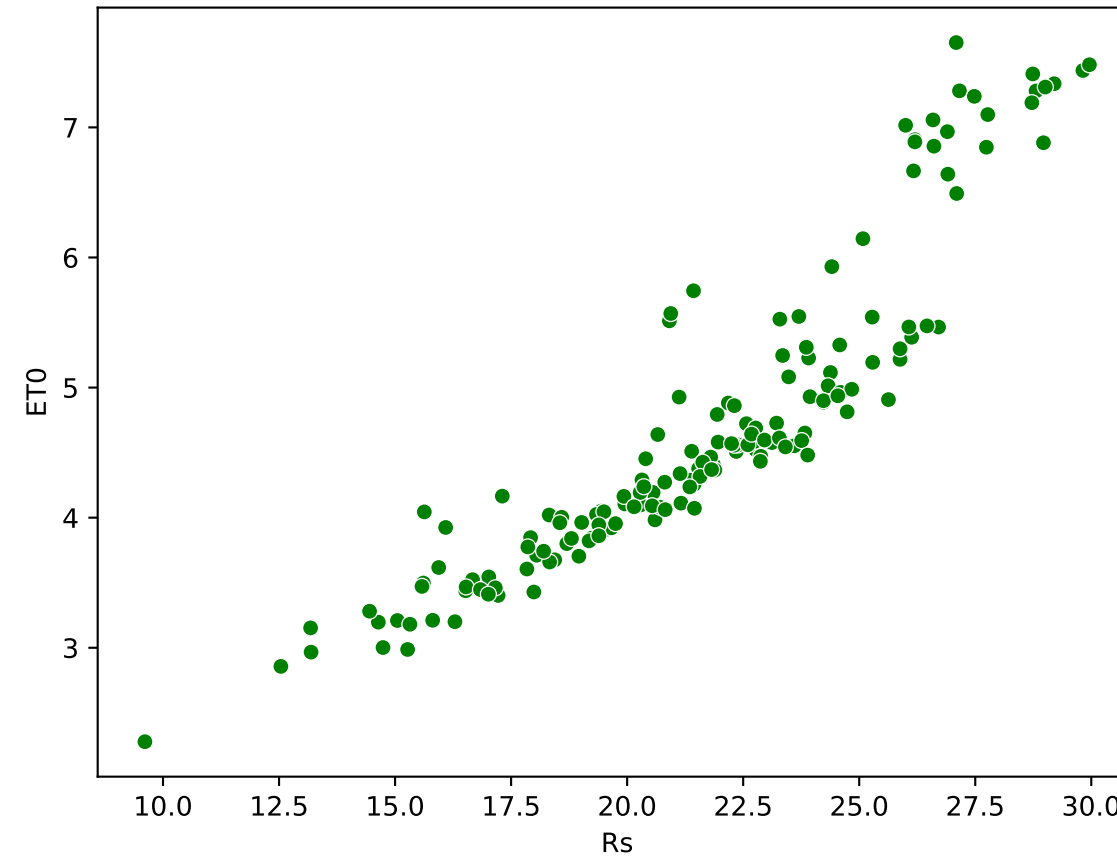


# Dispersión — Zapopan (2016)

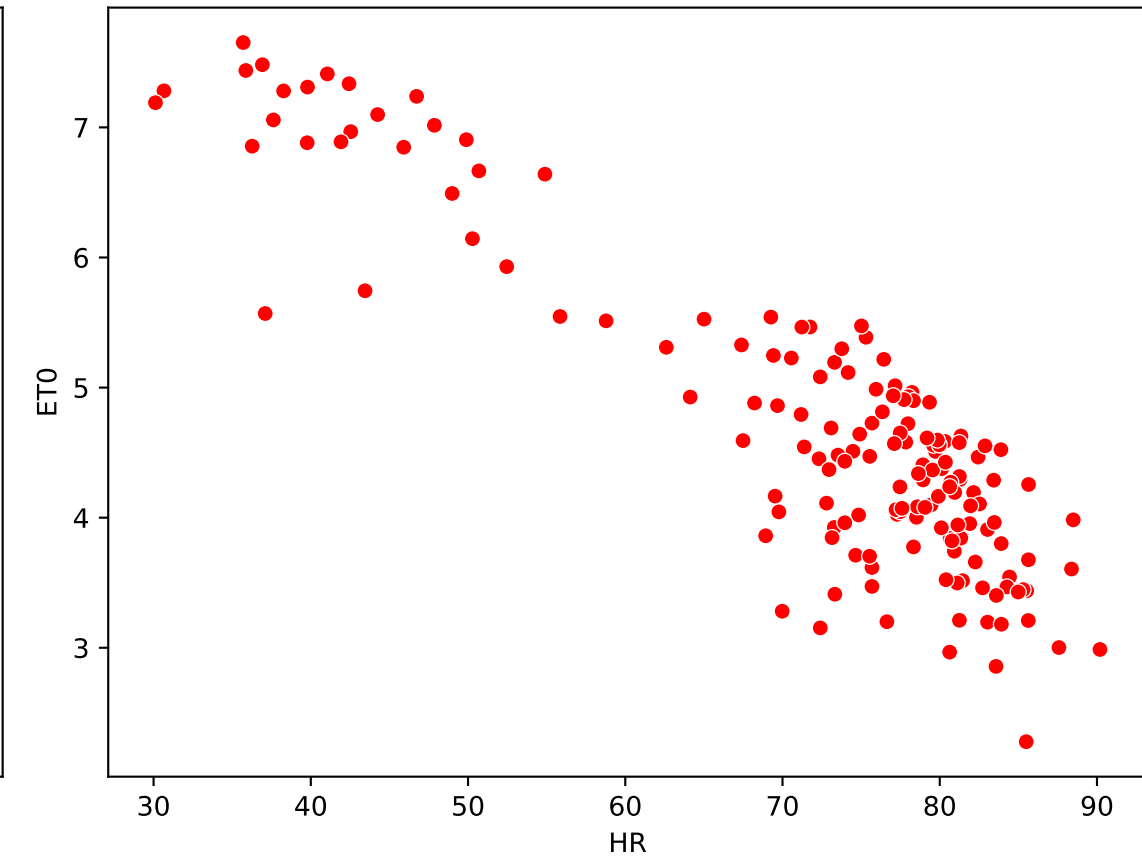
## Tmax vs ET0



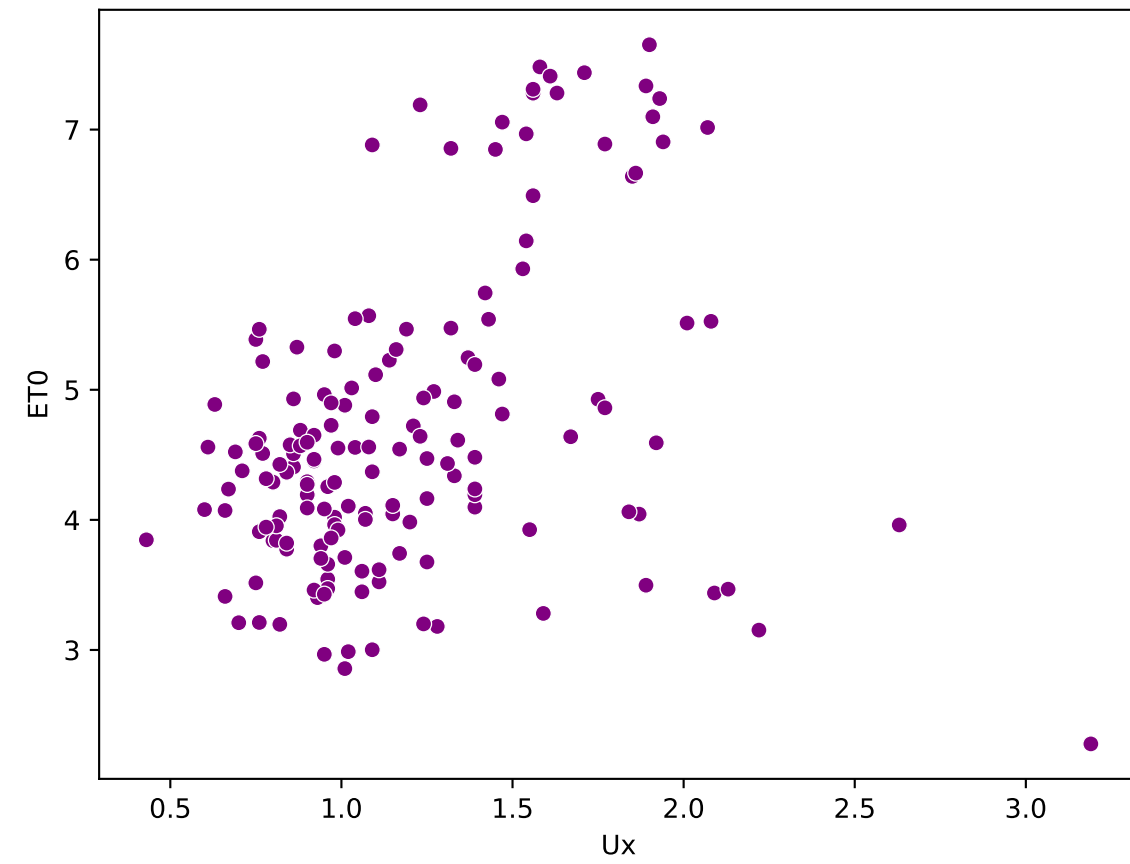
## Rs vs ET0



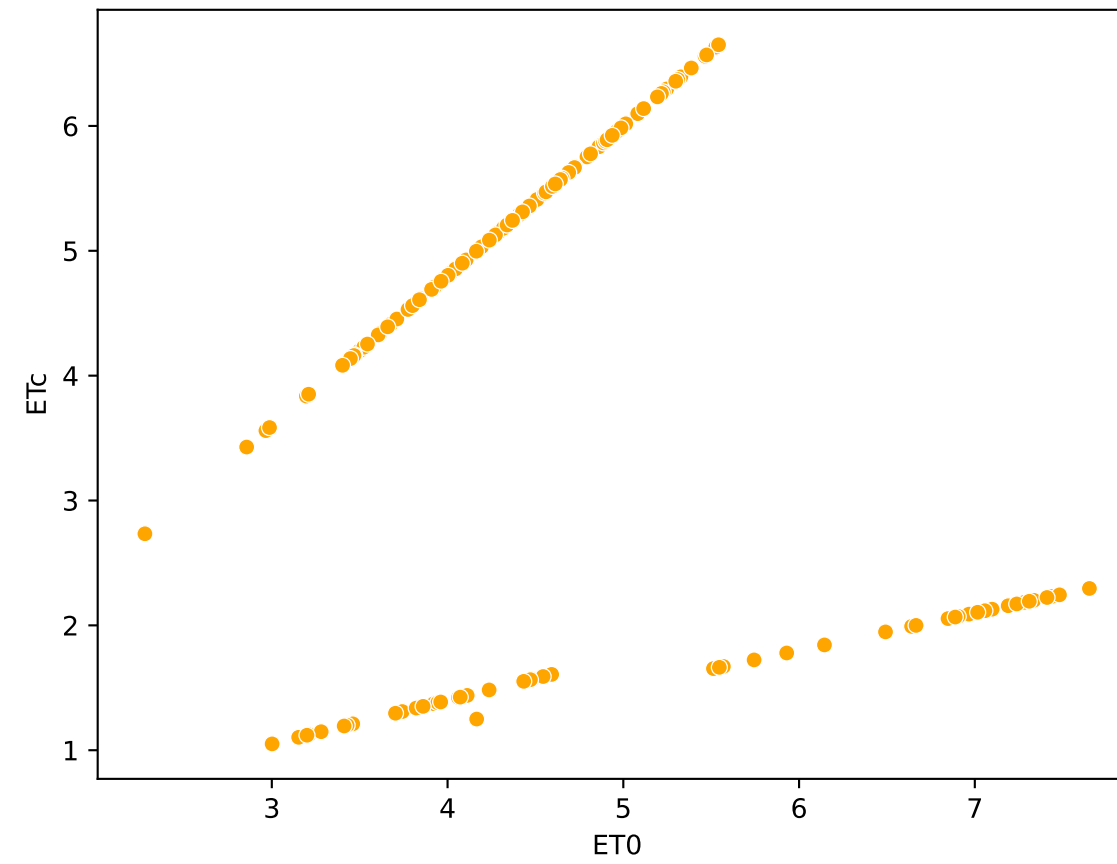
## HR vs ET0



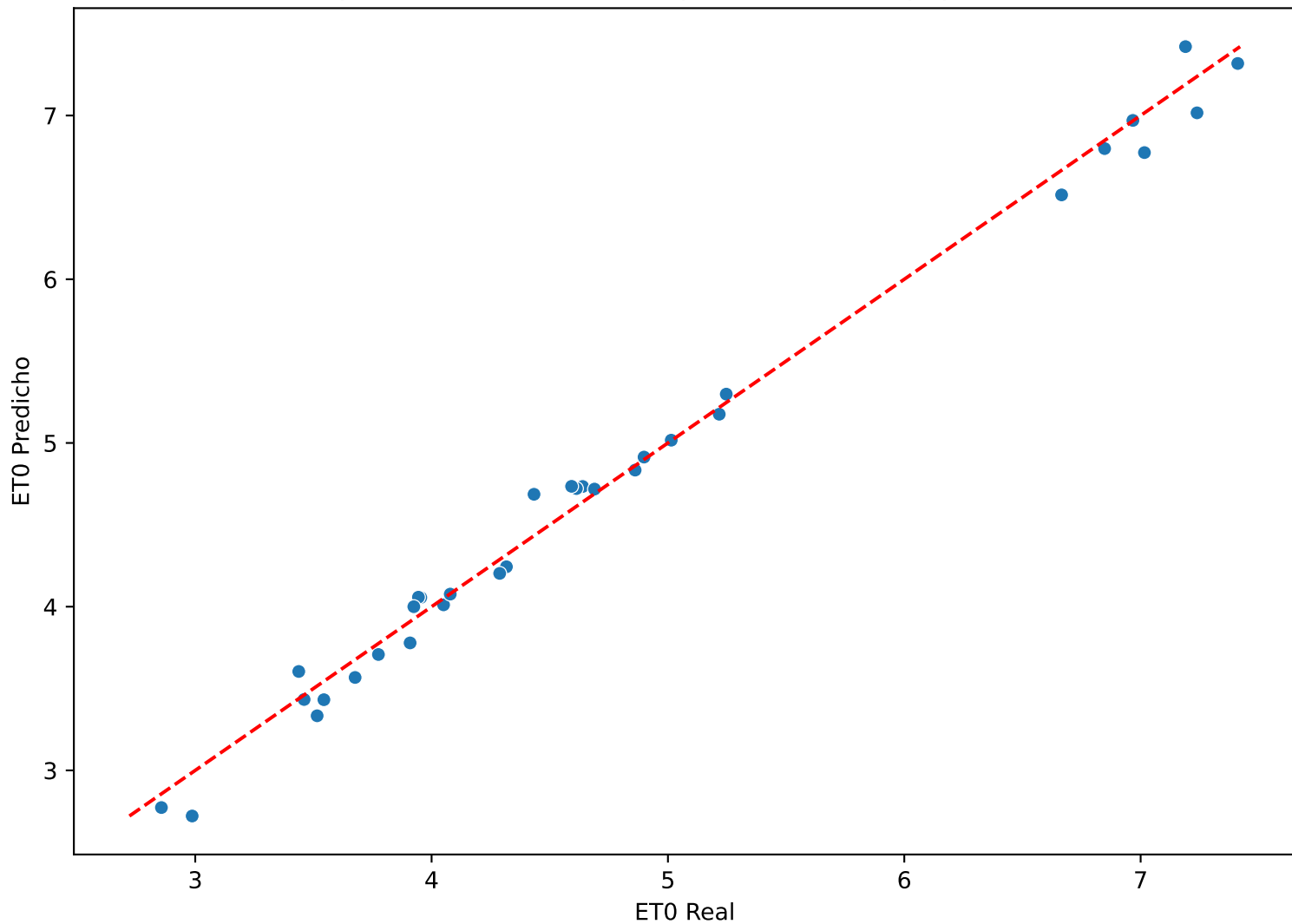
## Ux vs ET0



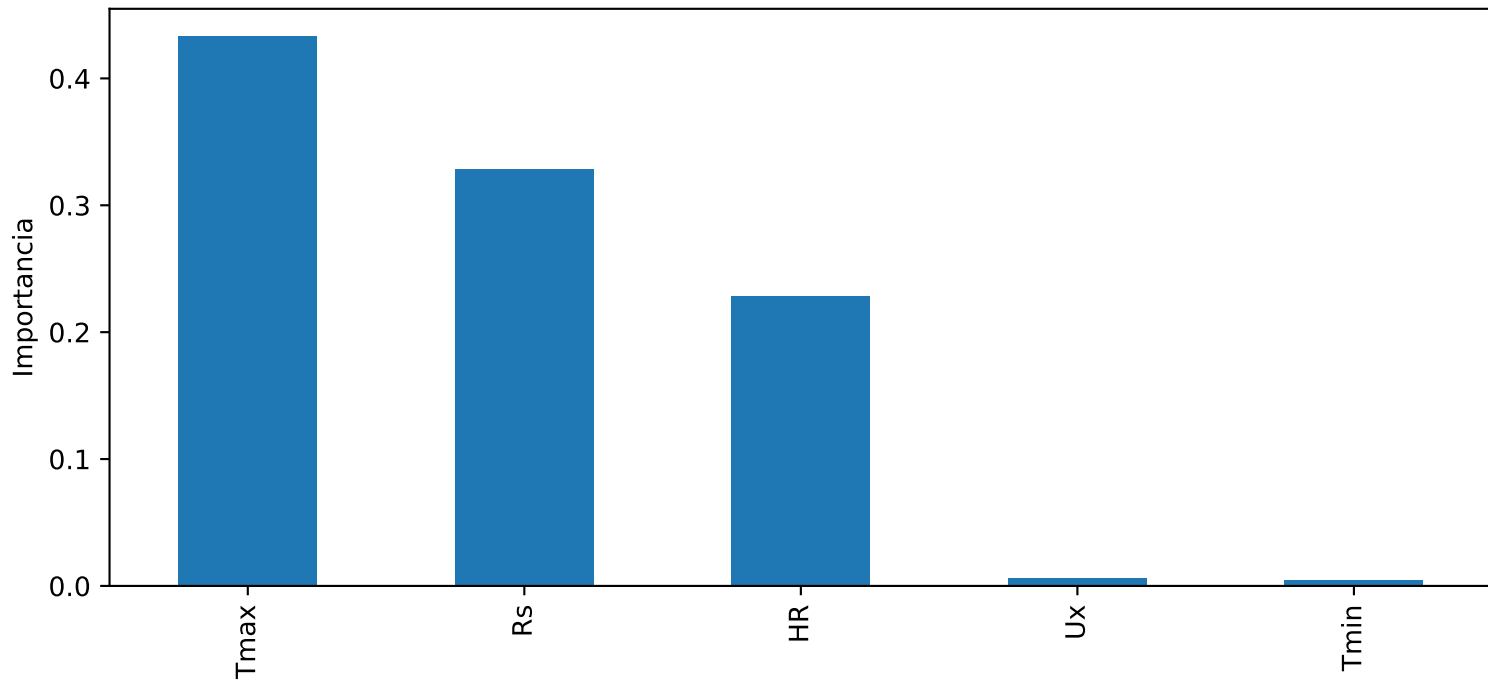
## ET0 vs ETc



Comparación entre ET0 Real y Predicho — Zapopan (2016)

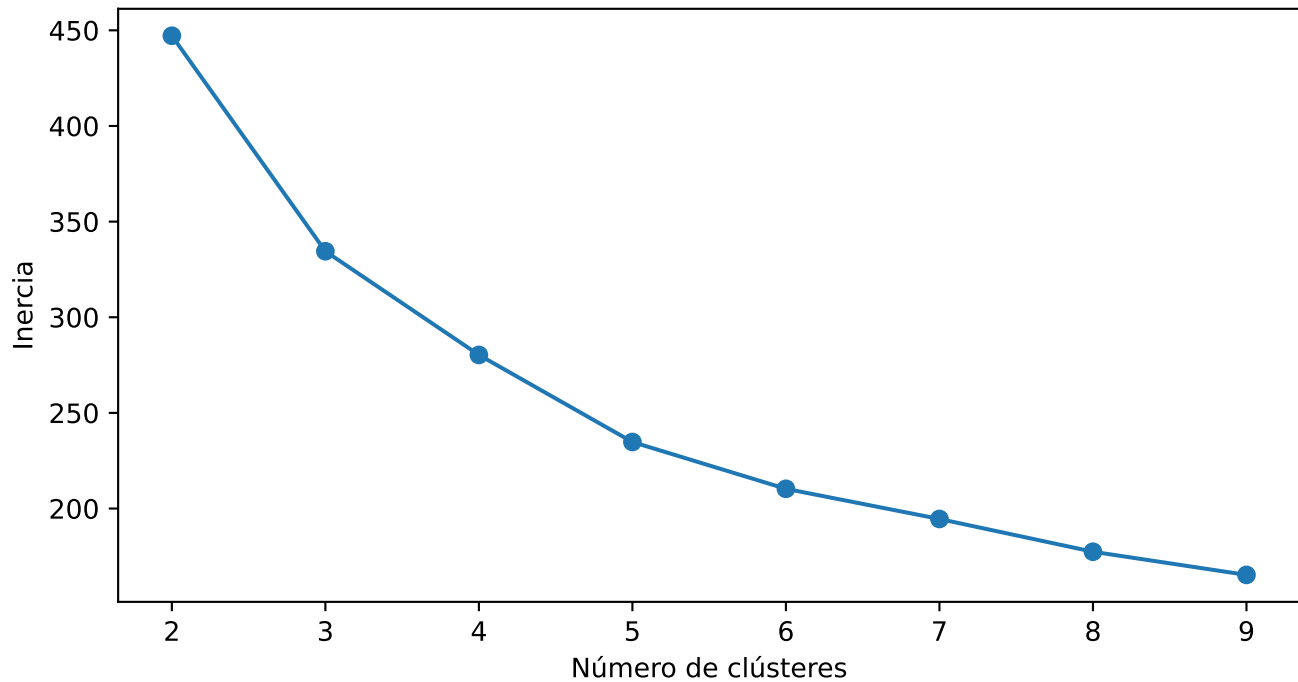


Importancia de variables (RF) — Zapopan (2016)

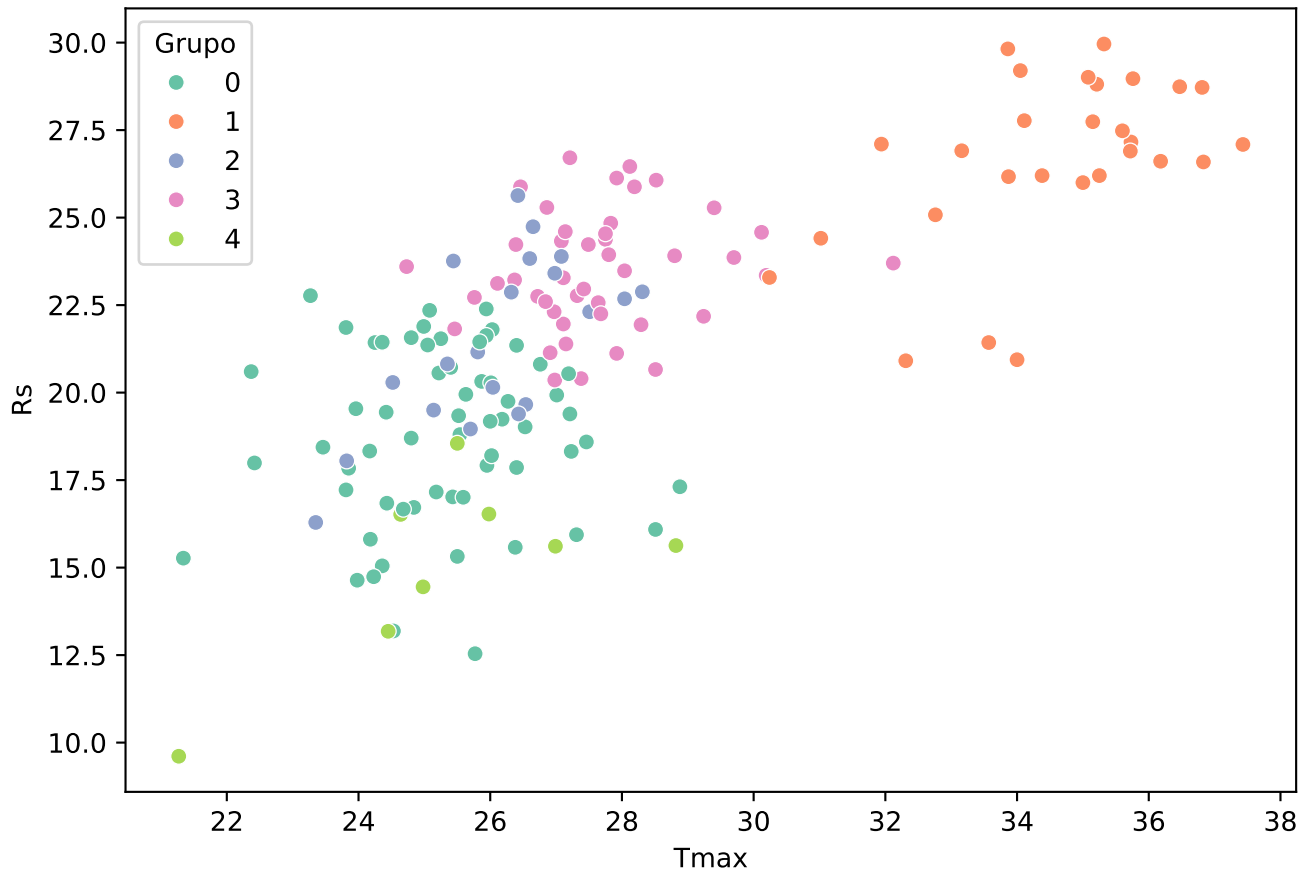




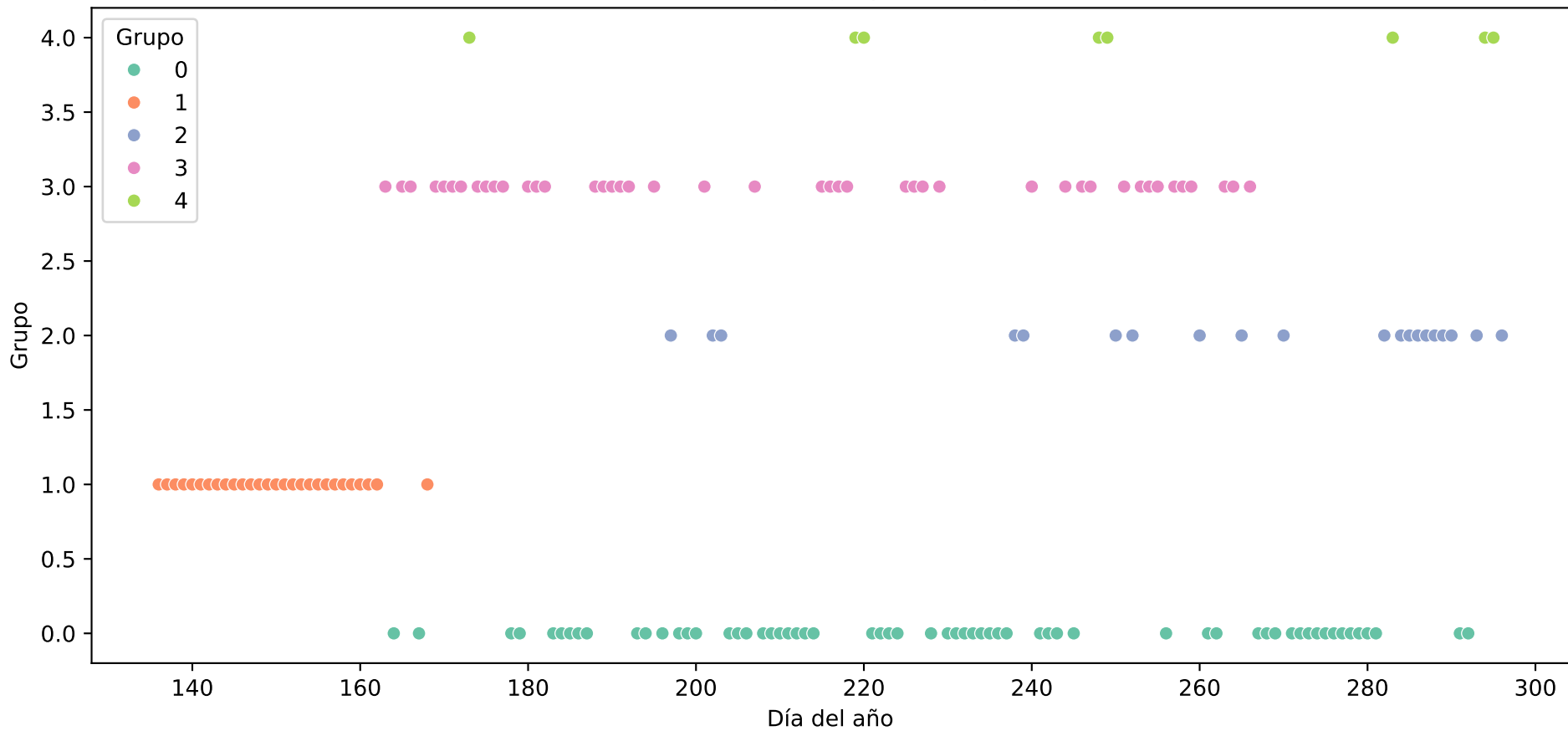
Método del codo



Clasificación de días climáticos — Zapopan (2016)

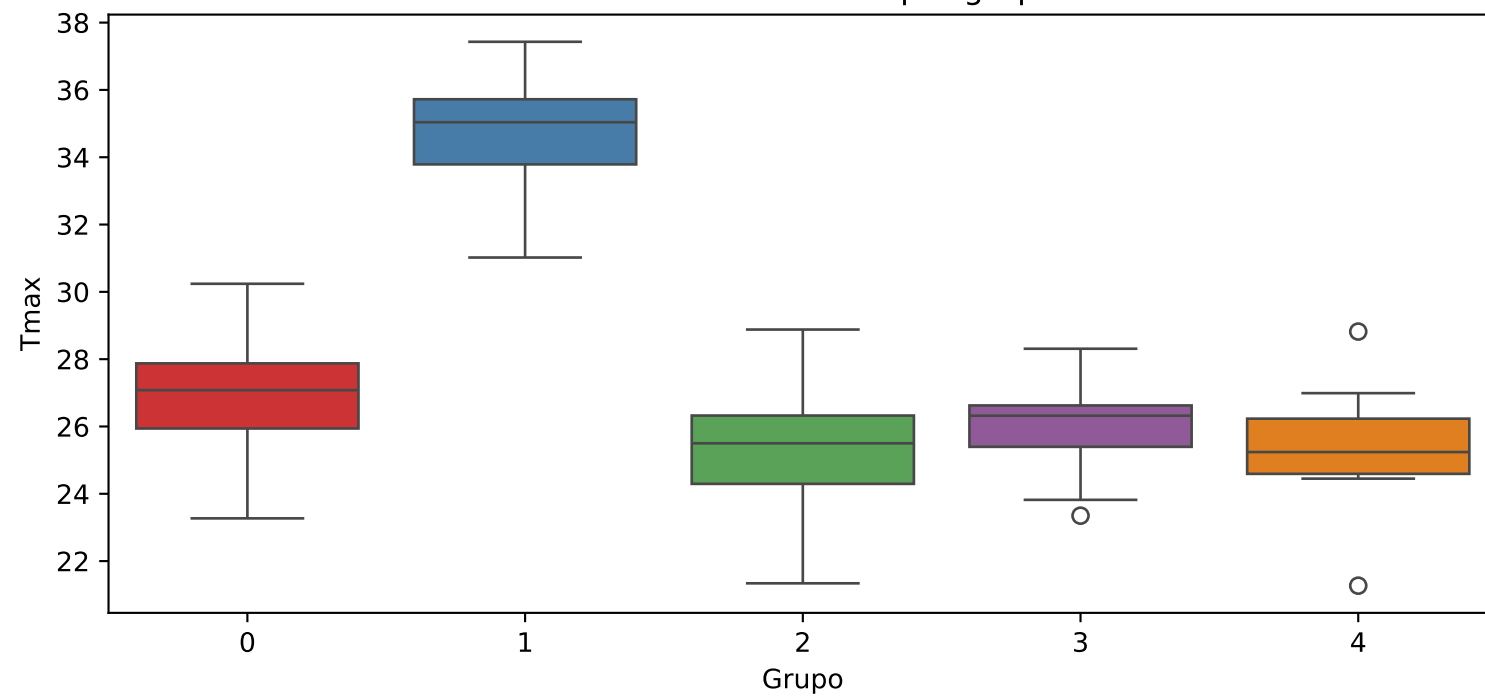


Distribución de días por grupo — Zapopan (2016)

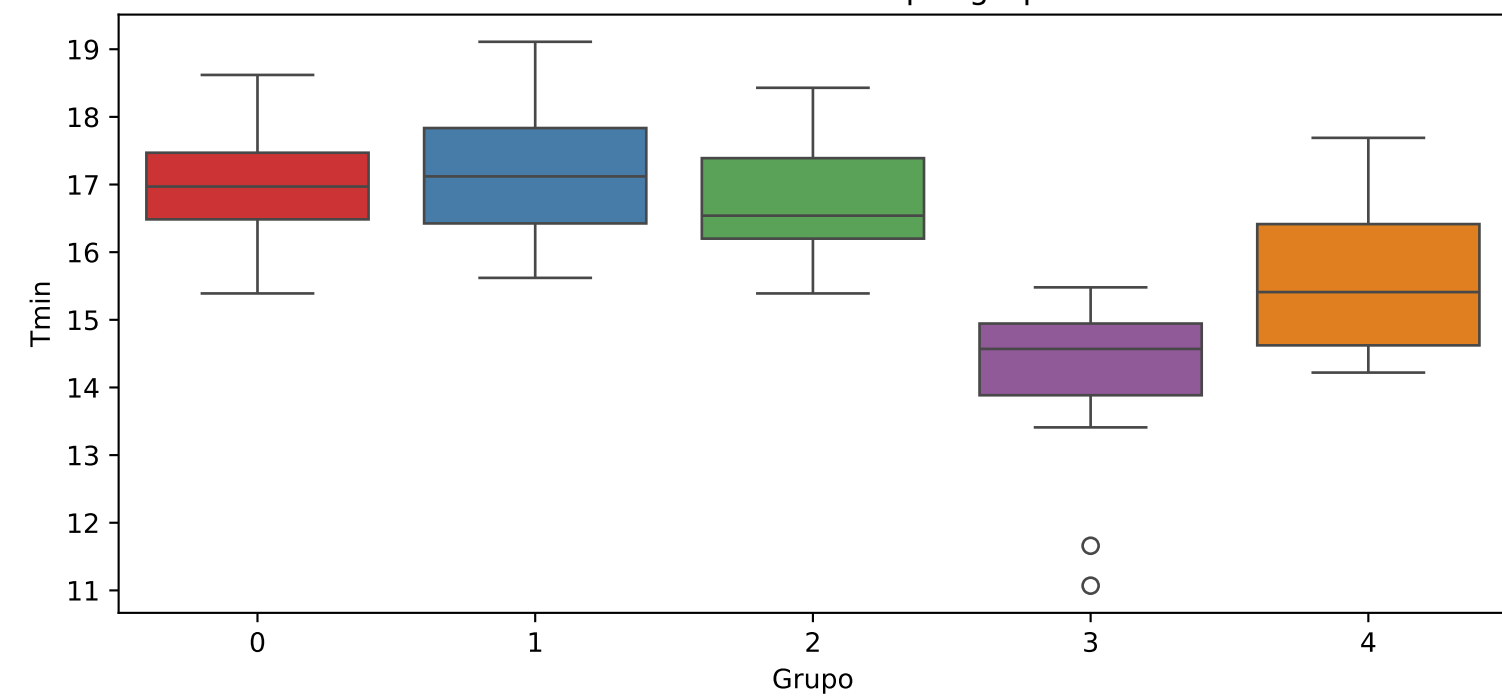


# Boxplots por grupo — Zapopan (2016)

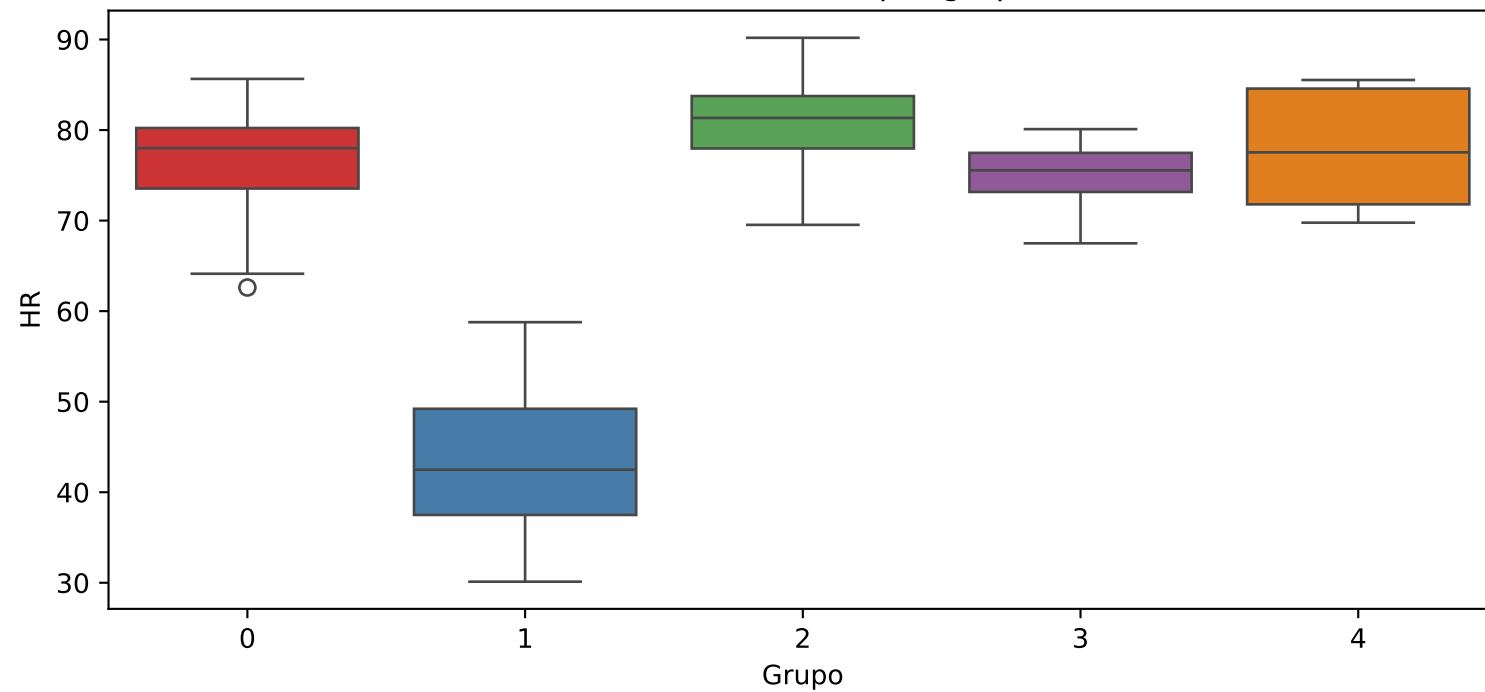
## Distribución de Tmax por grupo



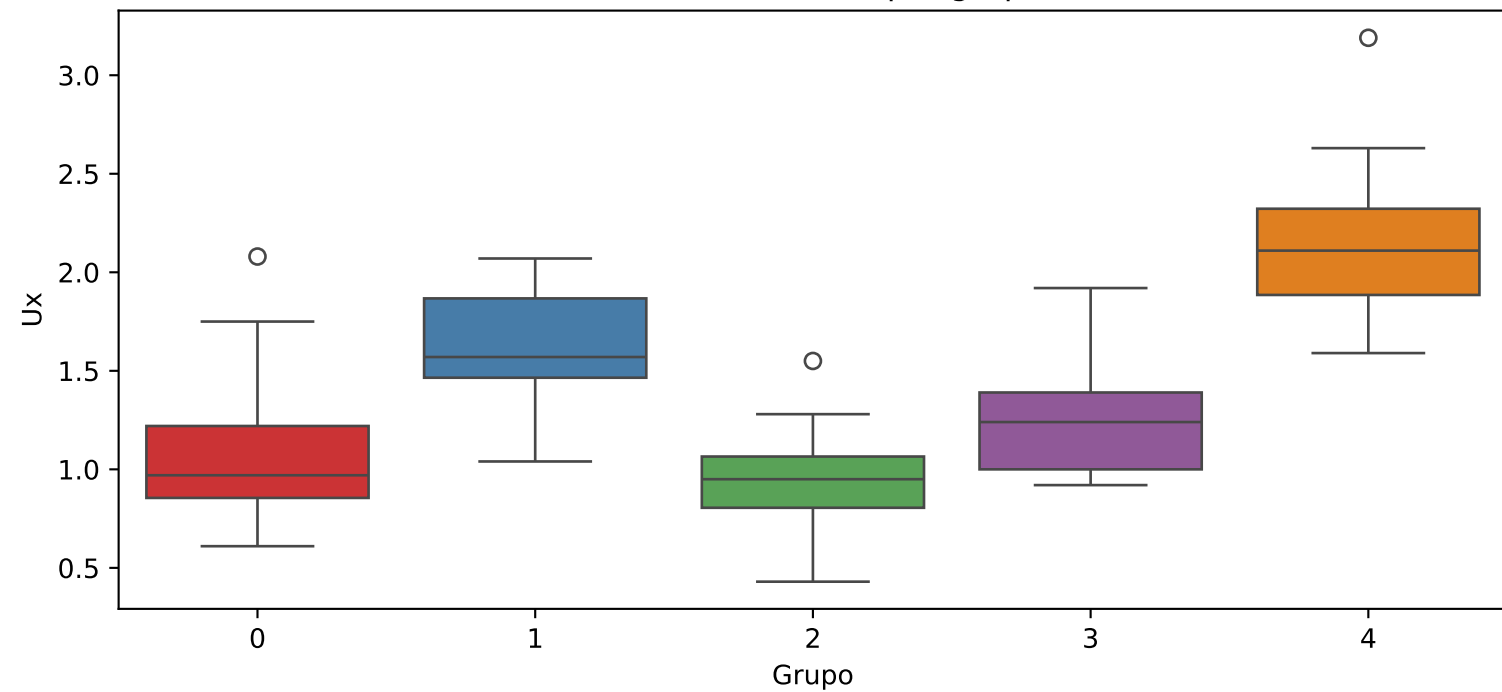
## Distribución de Tmin por grupo



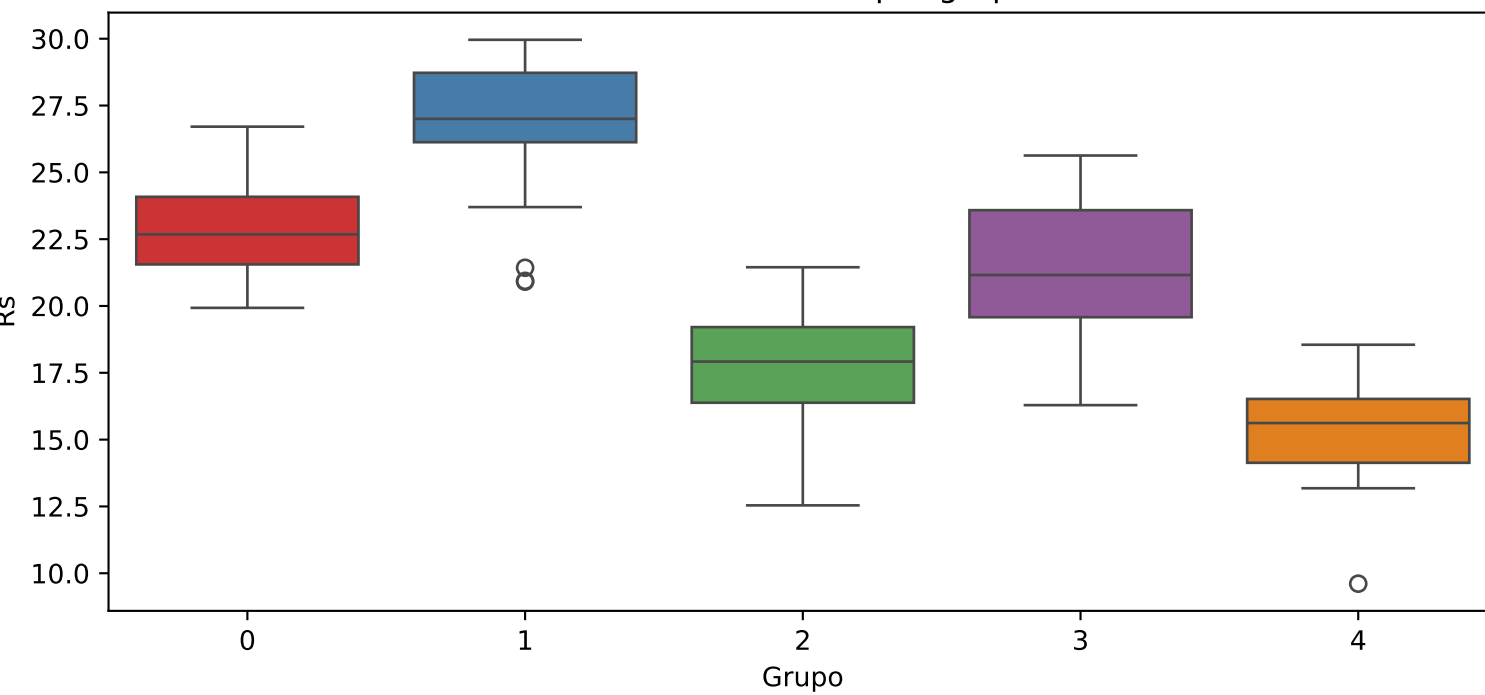
## Distribución de HR por grupo



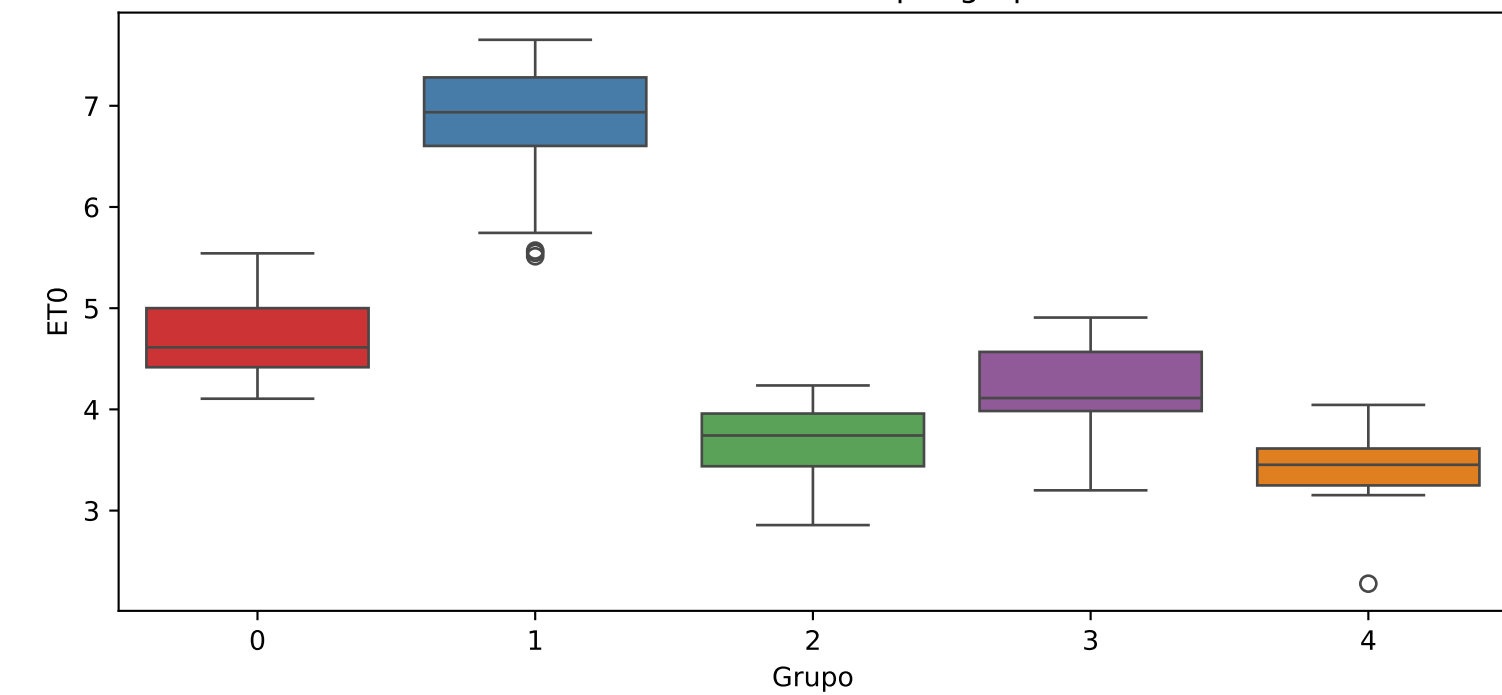
## Distribución de Ux por grupo



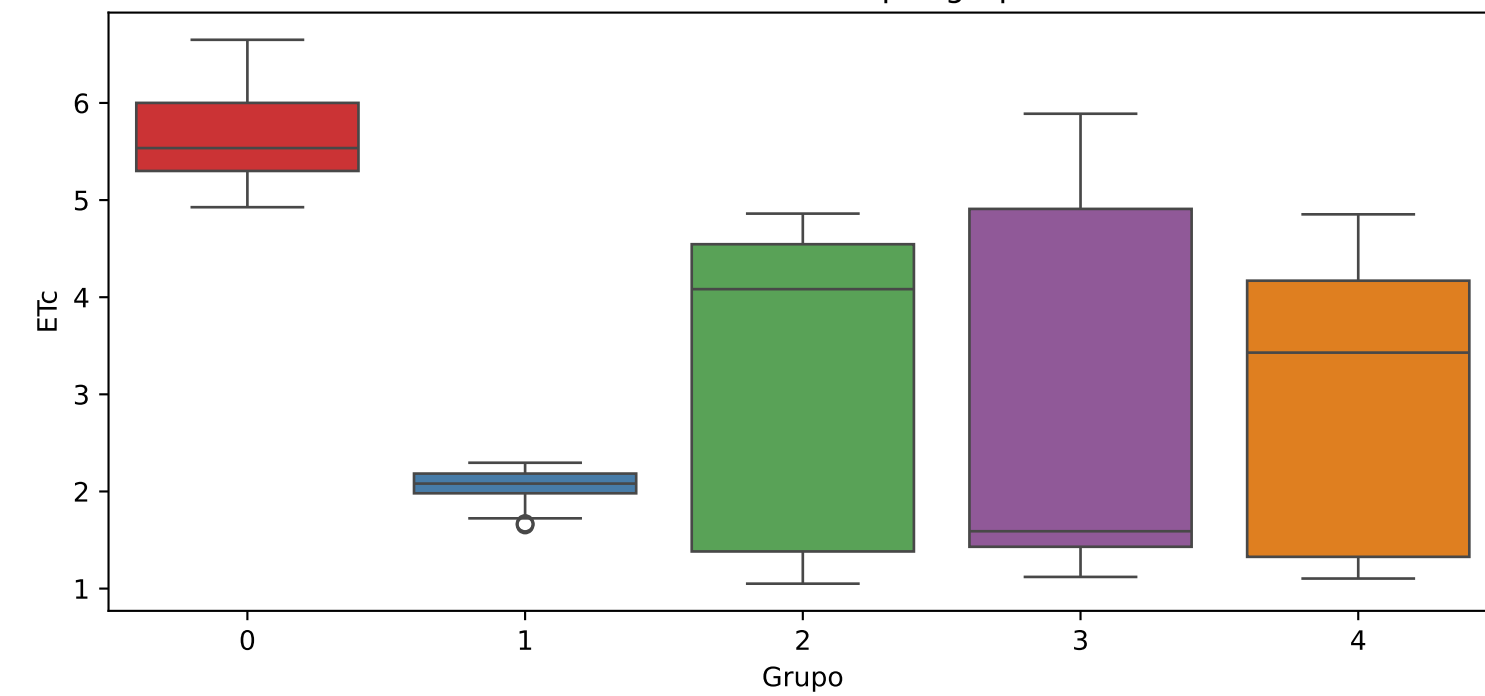
## Distribución de Rs por grupo



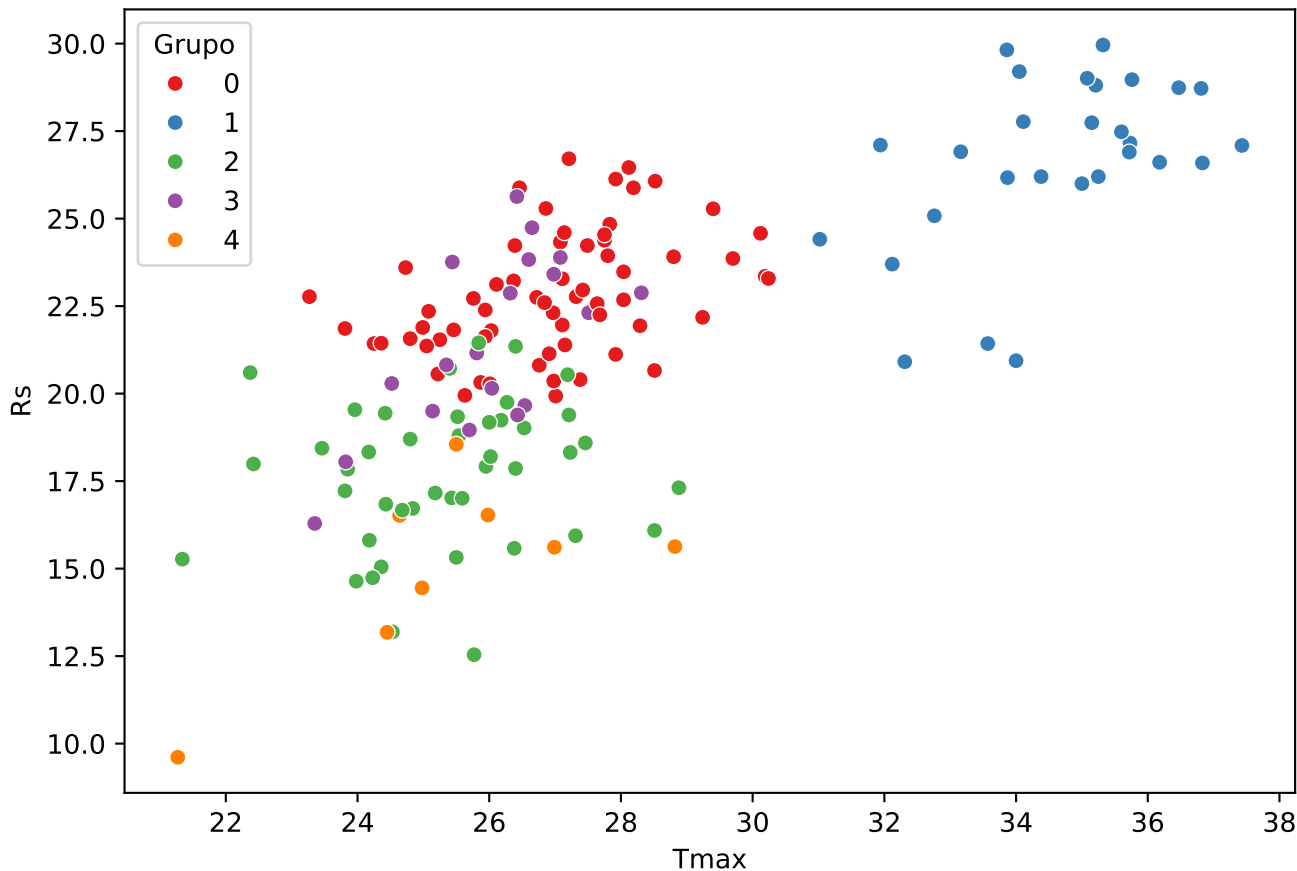
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2016)



## **Zapopan — 2017**

Días del ciclo: 161

ETc total [mm]: 659.4

ETverde total [mm]: 310.5

ETazul total [mm]: 348.9

Tmax / Tmin [°C]: 37.6 / 11.8

## Zapopan — 2017 · Resultados y métricas

[Zapopan 2017] Regresión Lineal ET0 —  $R^2$ : 0.9941 MSE: 0.0124

[Zapopan 2017] Random Forest ET0 —  $R^2$ : 0.9933 MSE: 0.0142

Importancias: {'Tmax': 0.6833341093253716, 'Tmin': 0.003563457140817905, 'HR': 0.040992982581847685, 'Ux': 0.008644126090275902, 'Rs': 0.2634653248616869}

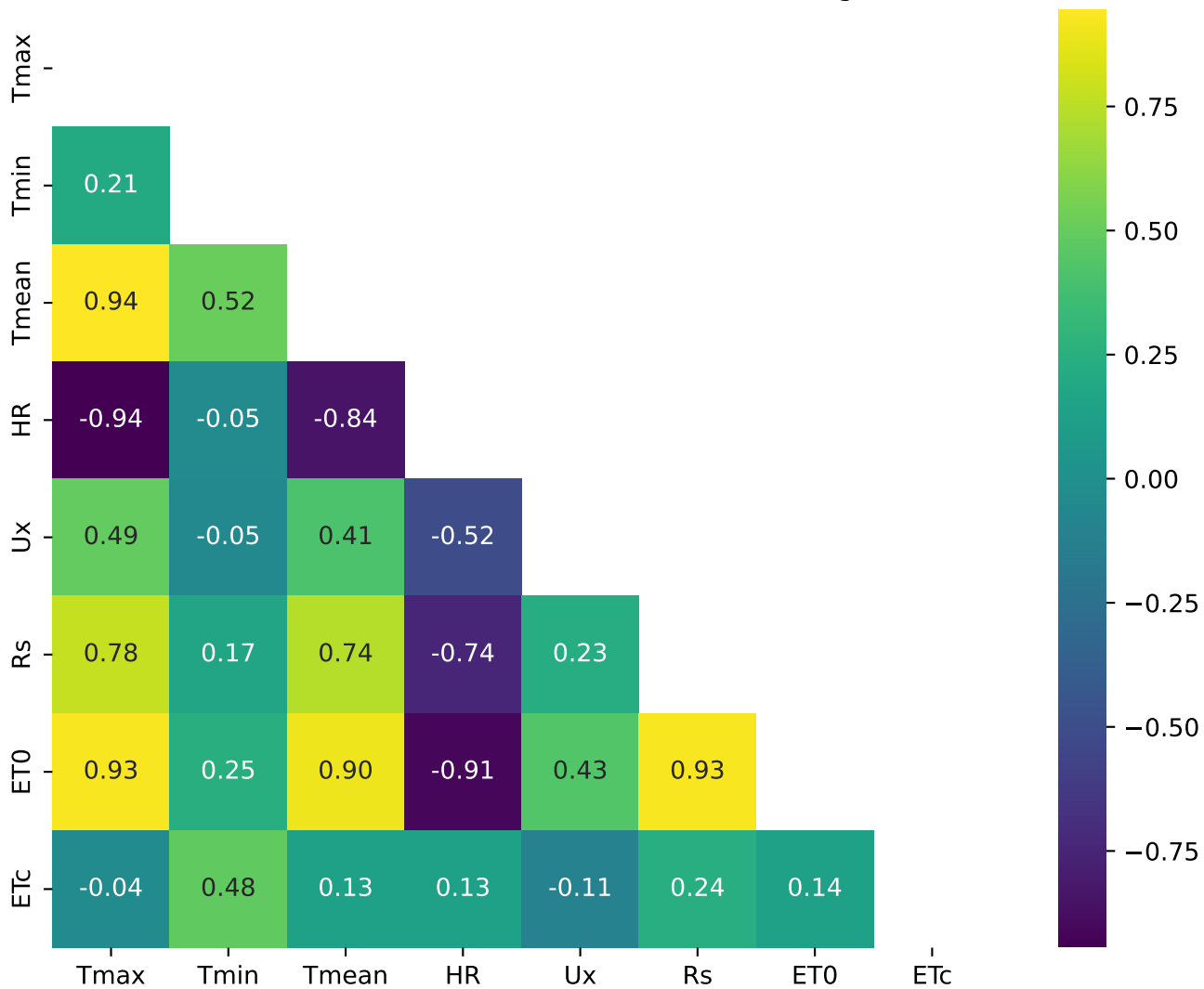
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	33.426429	19.037143	56.392857	1.781429	26.153571	6.524455	7.829346
1	26.495909	17.234848	78.392576	0.996364	21.655152	4.489818	5.387781
2	35.004828	17.015862	43.476552	1.616207	27.164483	6.949173	2.084752
3	25.075312	16.494688	81.915312	1.318437	15.379062	3.295761	2.758078
4	26.900000	13.921500	72.347500	1.494500	21.021500	4.243504	2.274606

**Zapopan — 2017**

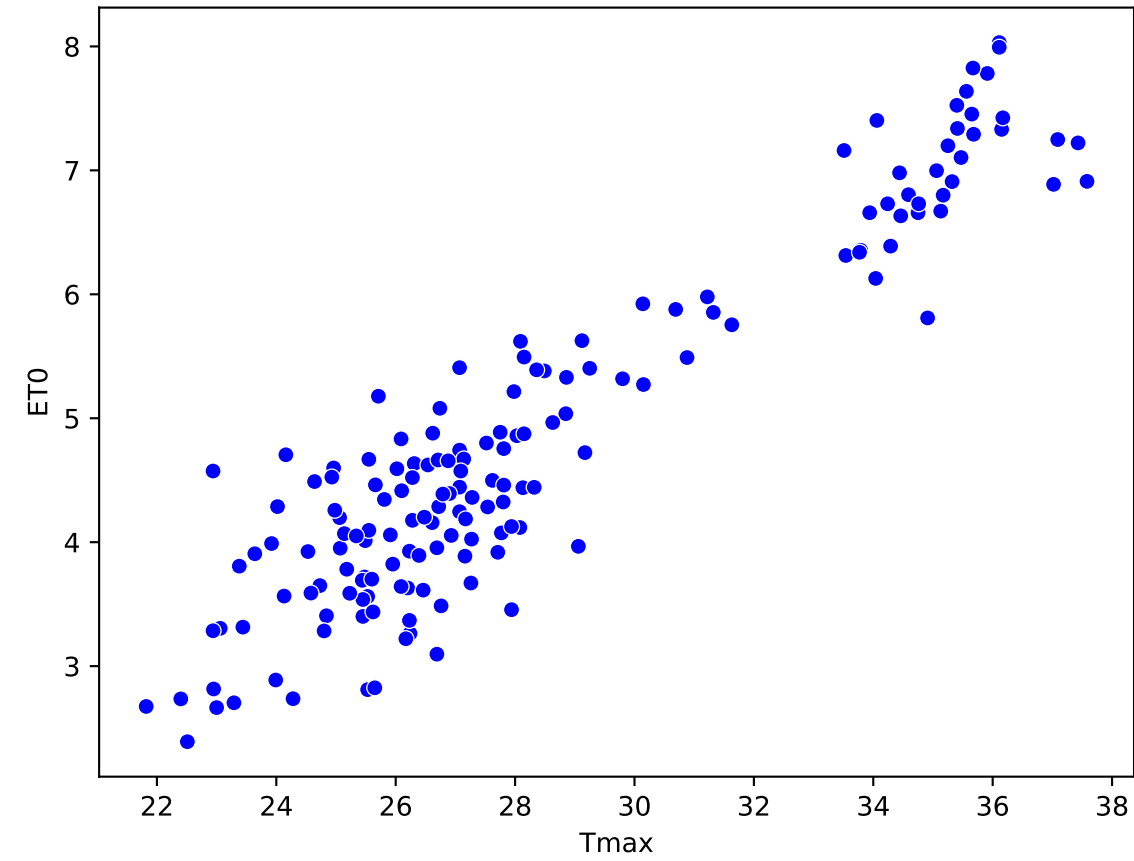


Matriz de Correlación entre Variables Meteorológicas

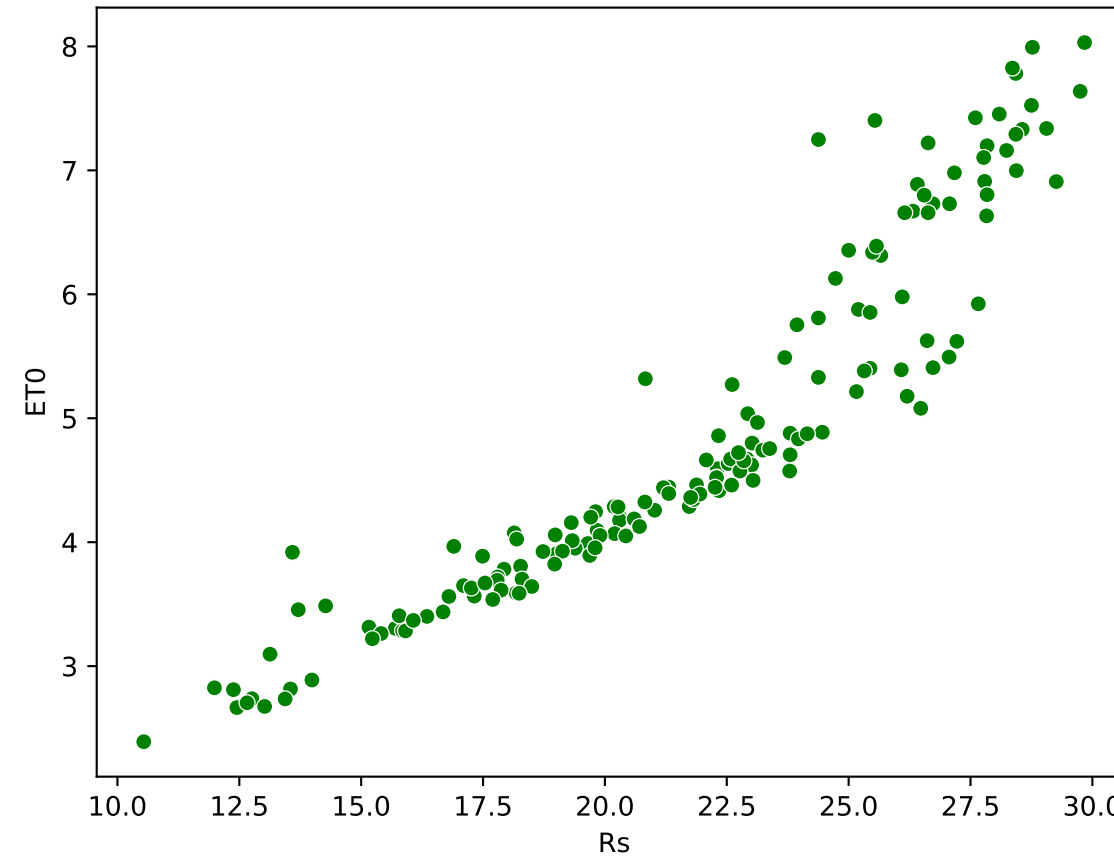


# Dispersión — Zapopan (2017)

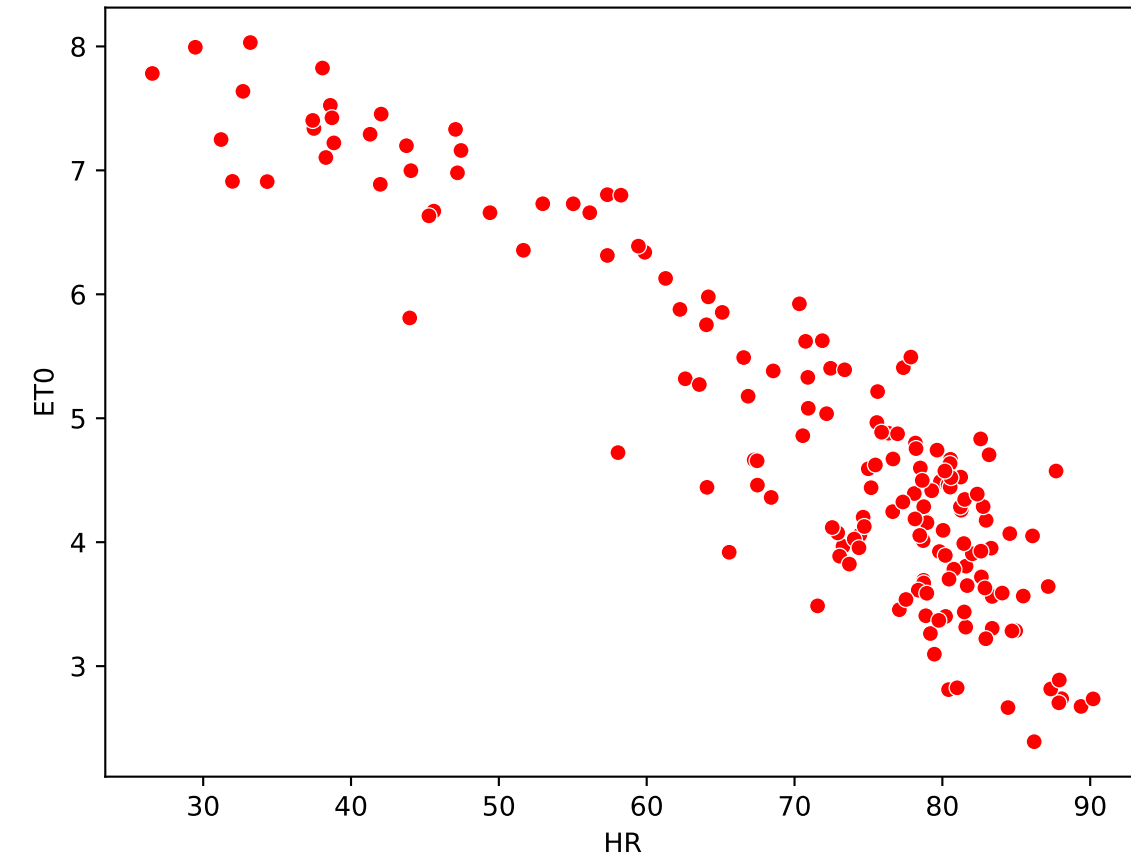
## Tmax vs ET0



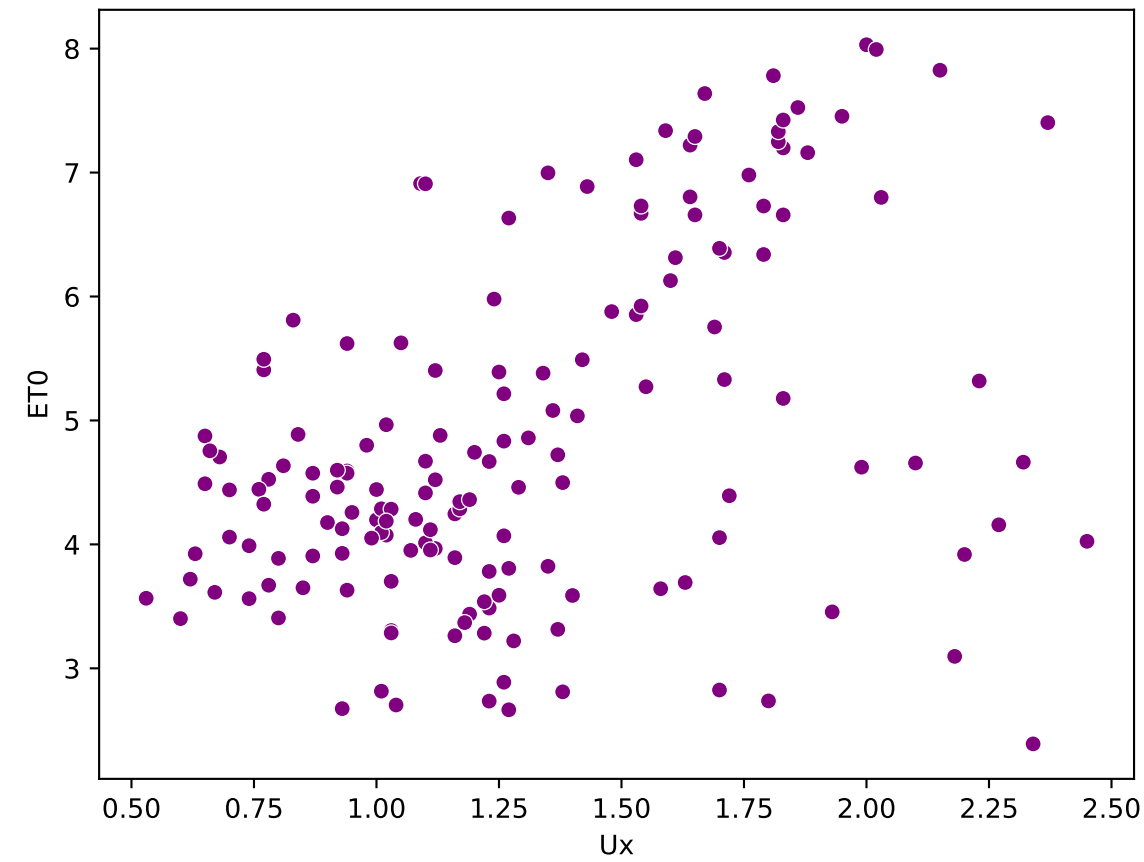
## Rs vs ET0



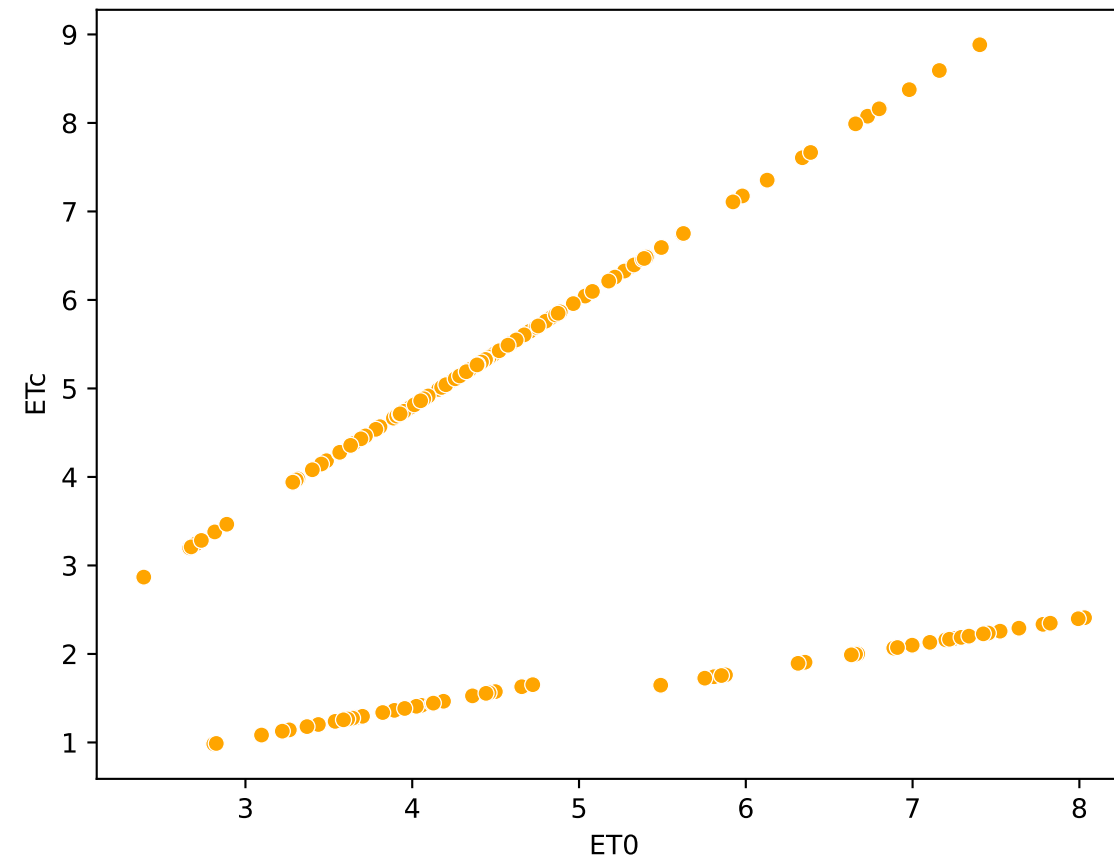
## HR vs ET0



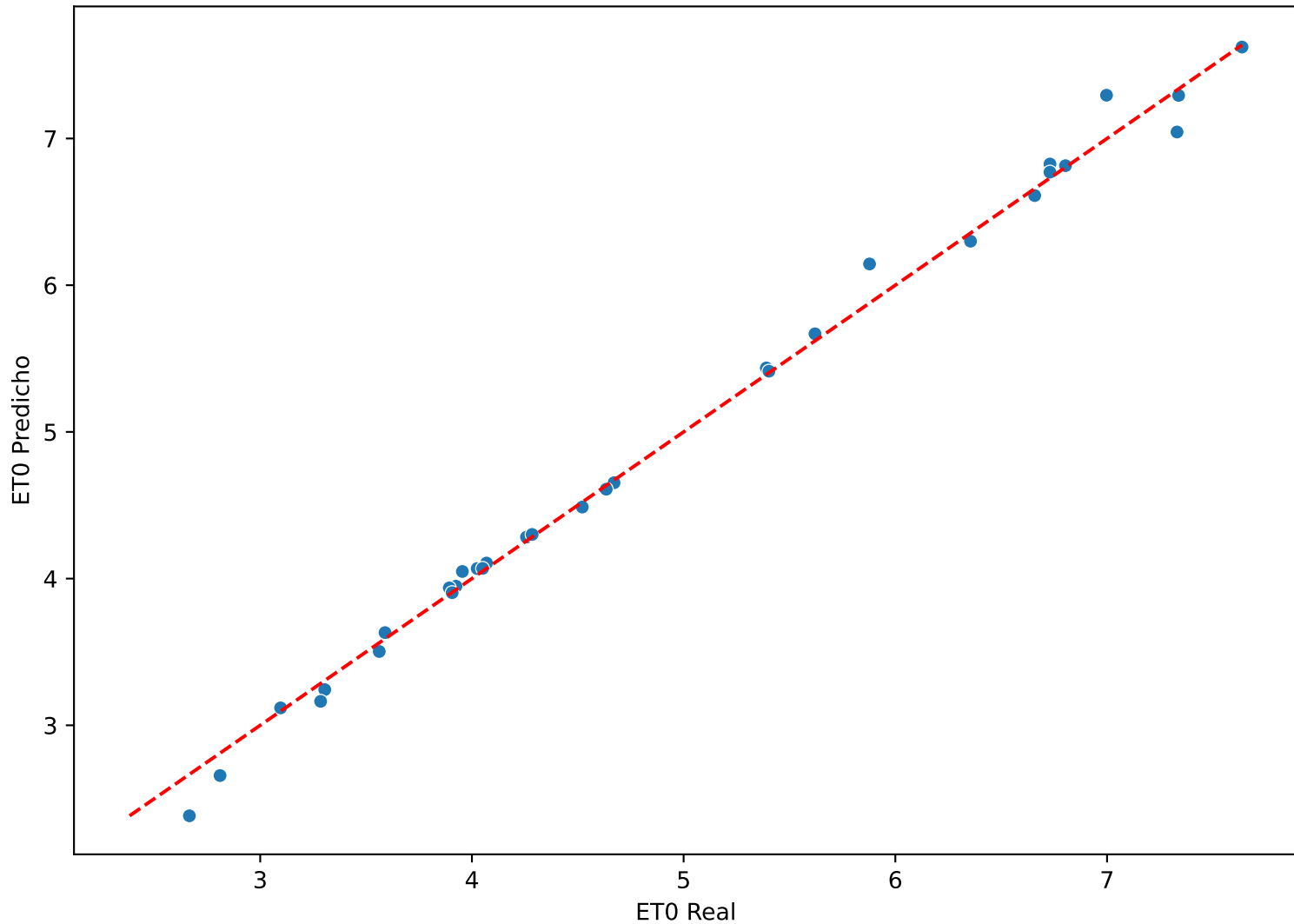
## Ux vs ET0



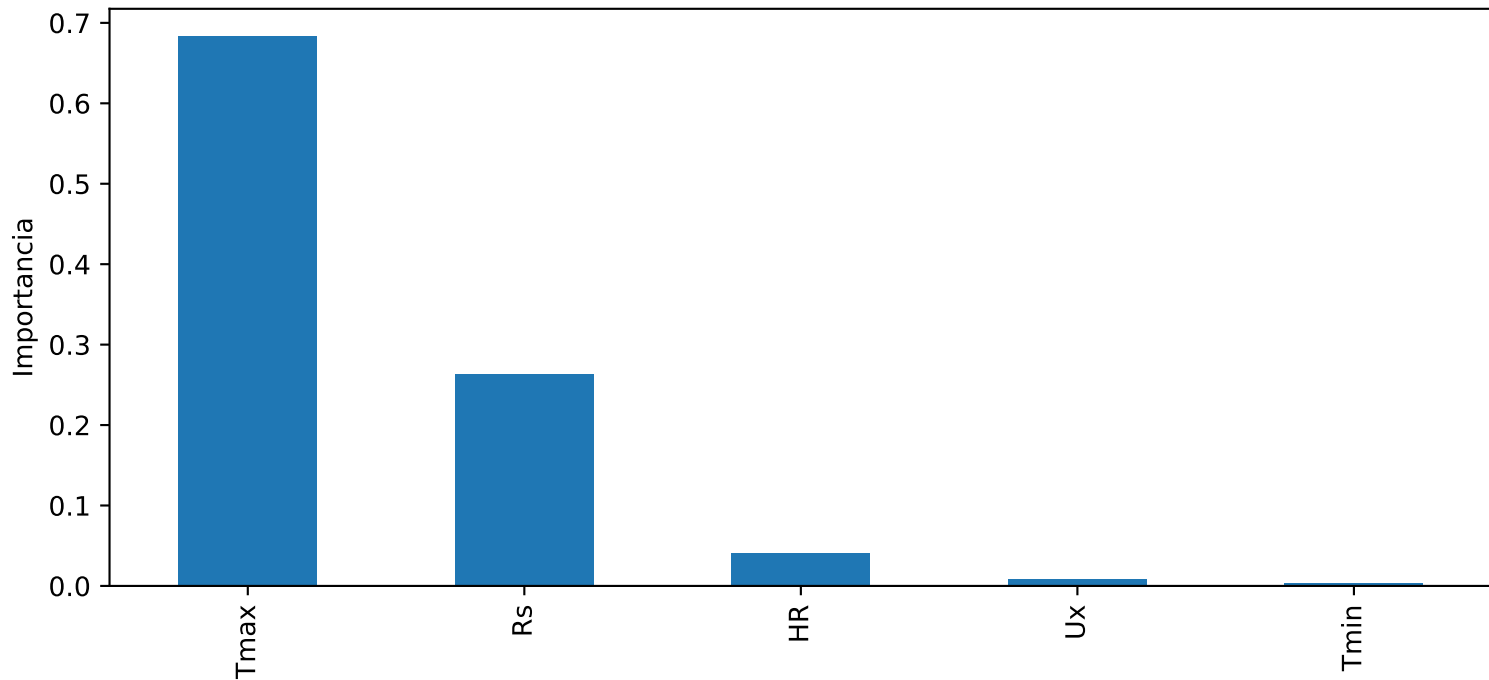
## ET0 vs ETc



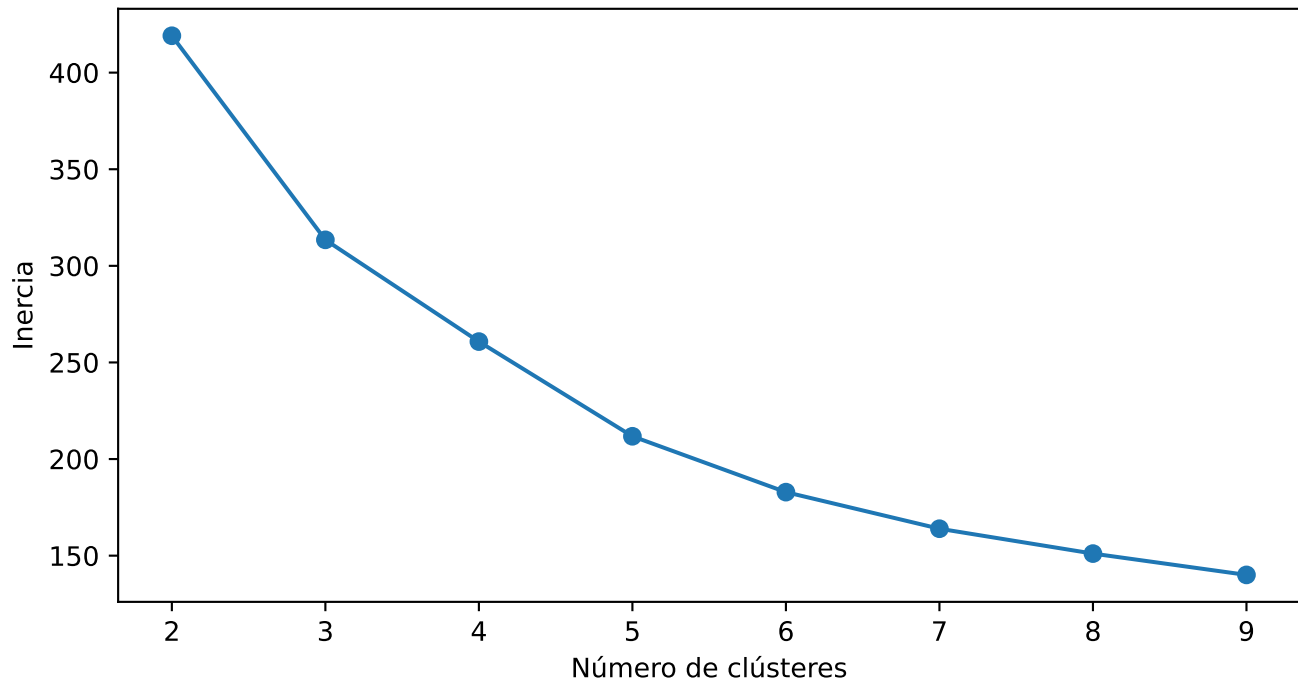
Comparación entre ET0 Real y Predicho — Zapopan (2017)



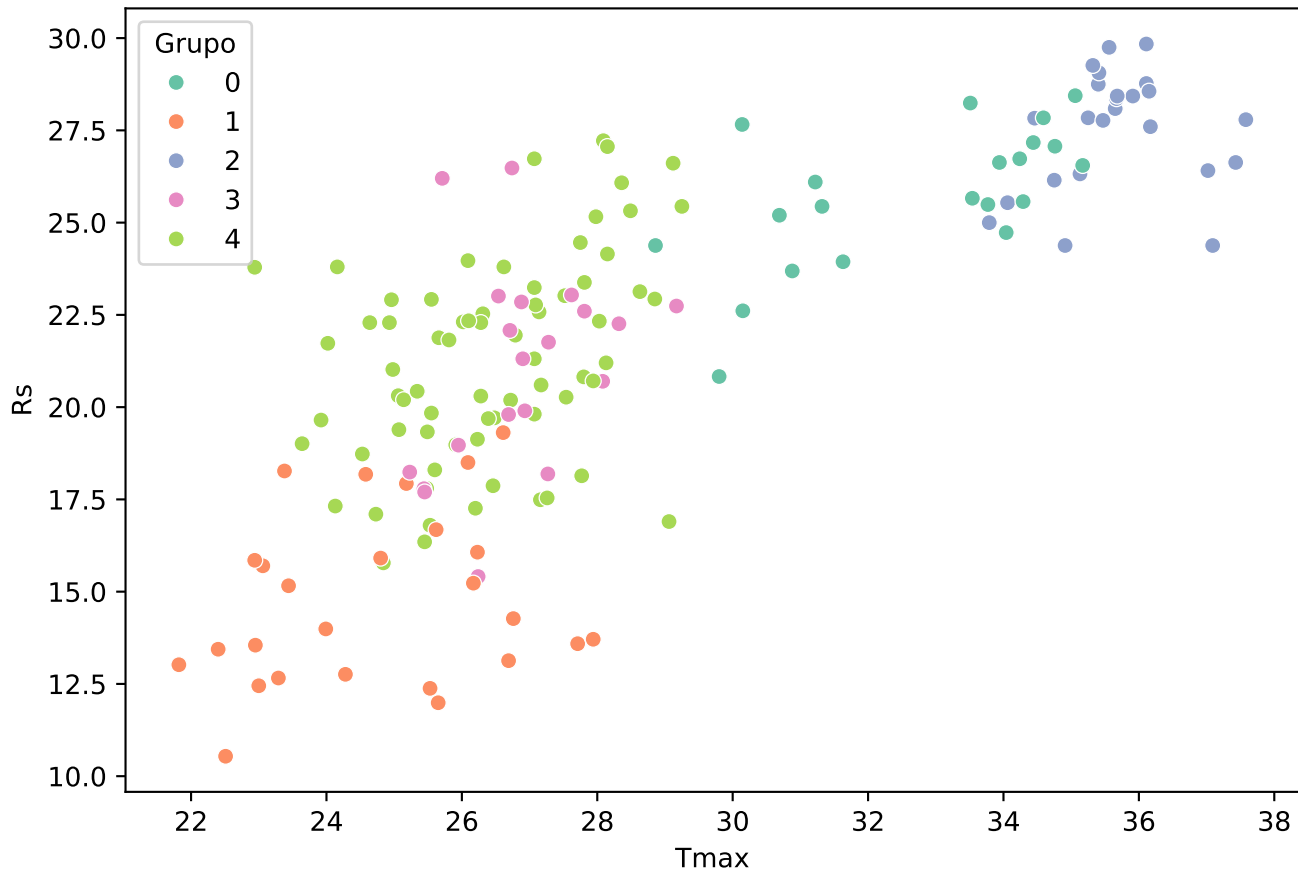
Importancia de variables (RF) — Zapopan (2017)



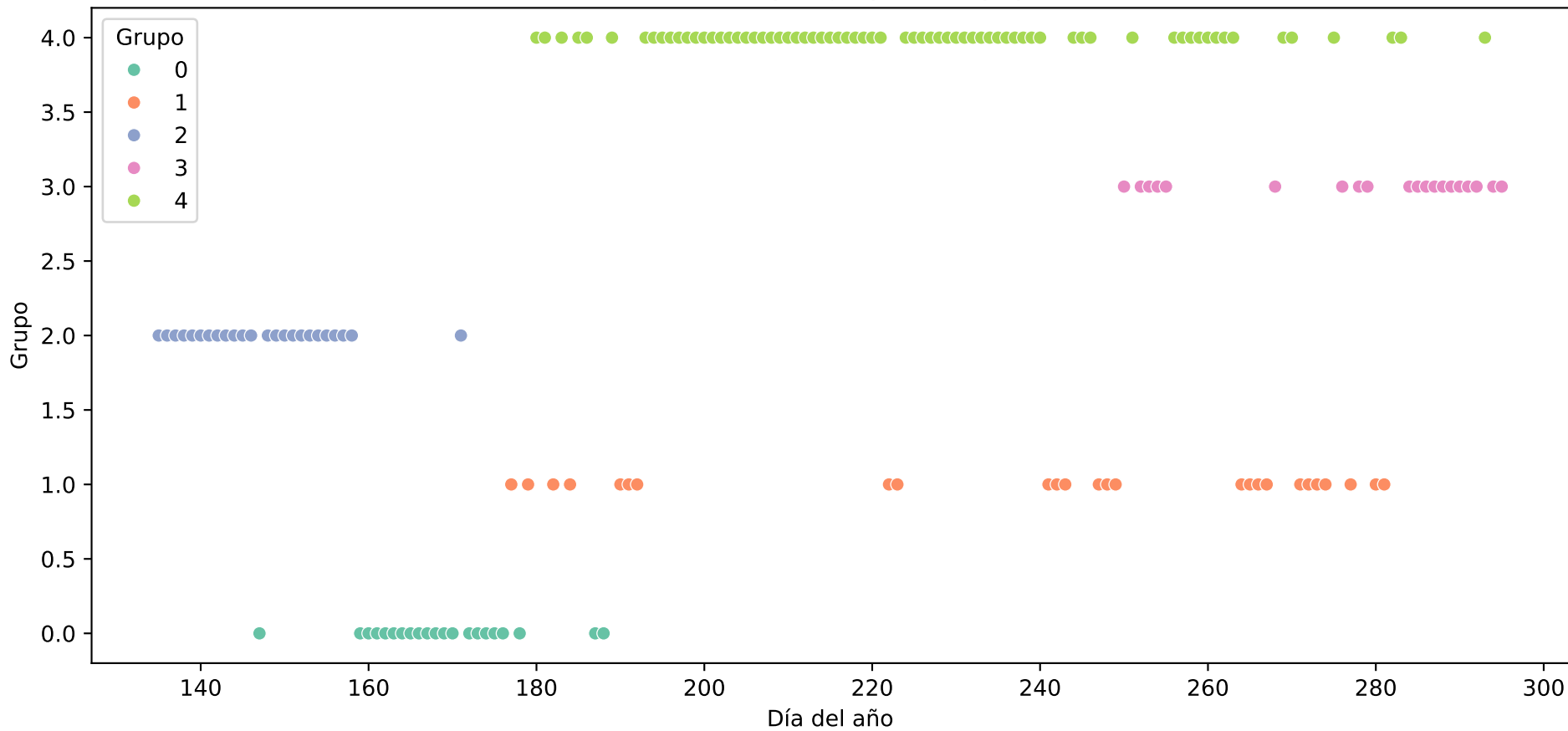
Método del codo



Clasificación de días climáticos — Zapopan (2017)

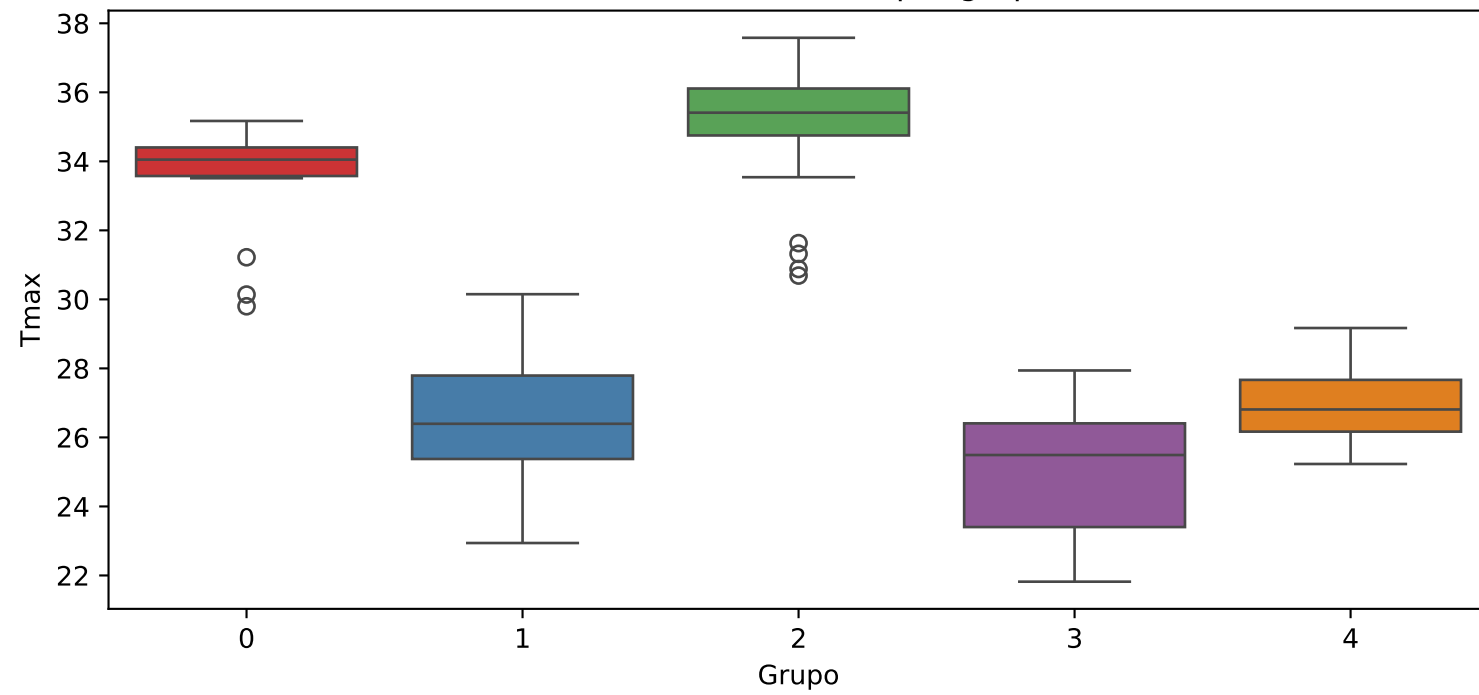


Distribución de días por grupo — Zapopan (2017)

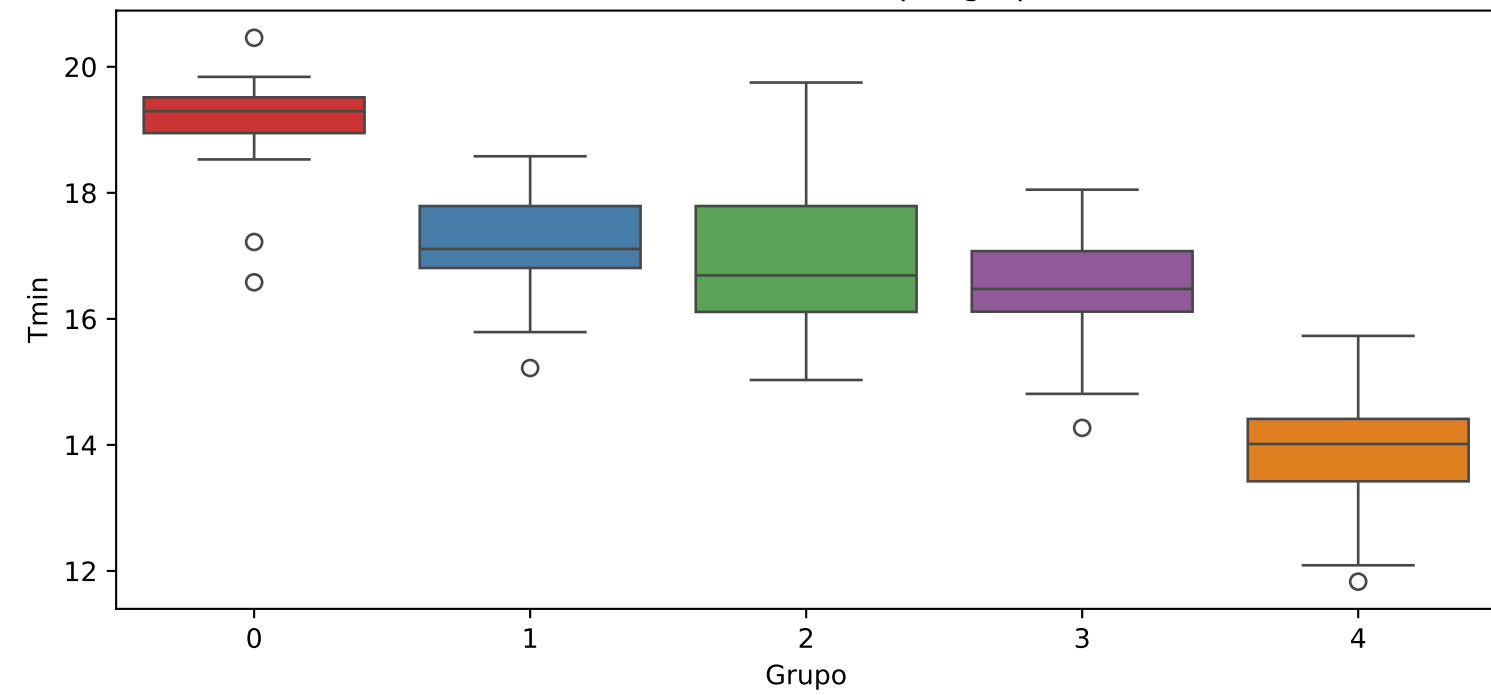


Boxplots por grupo — Zapopan (2017)

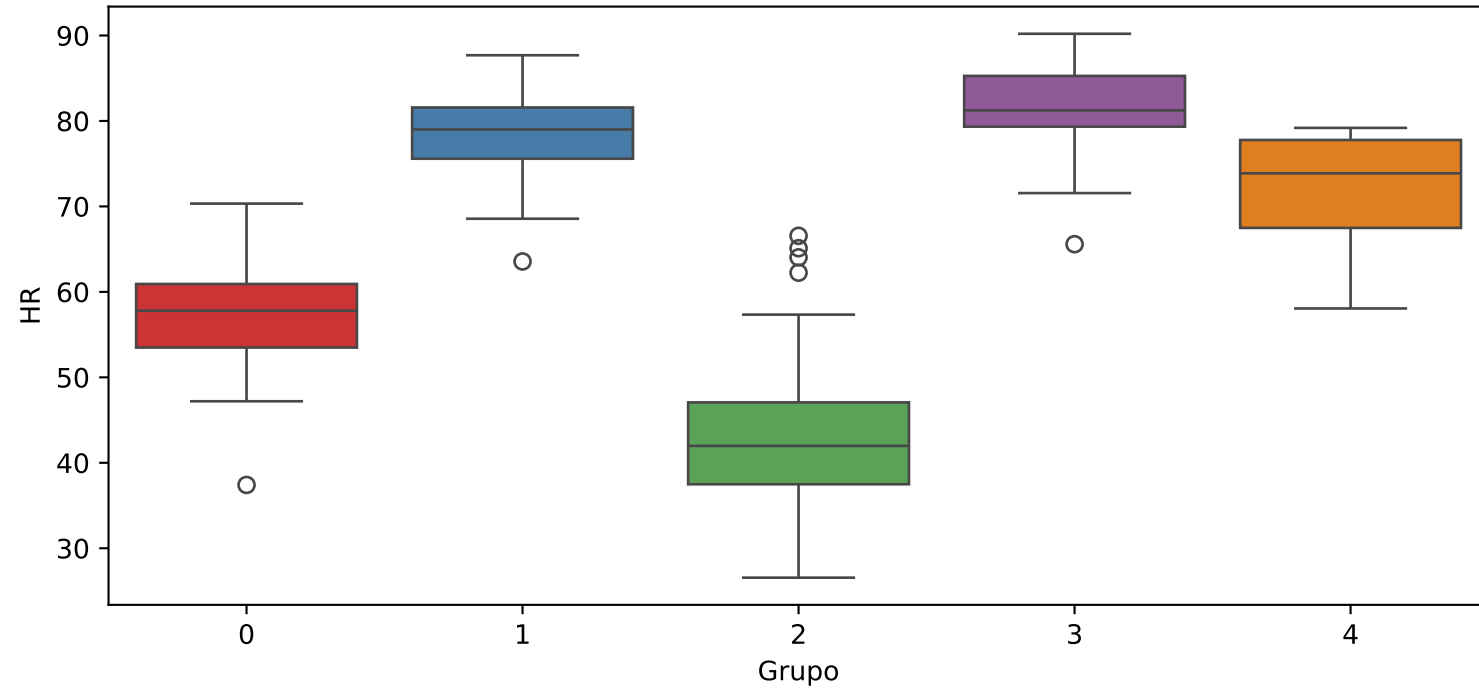
Distribución de Tmax por grupo



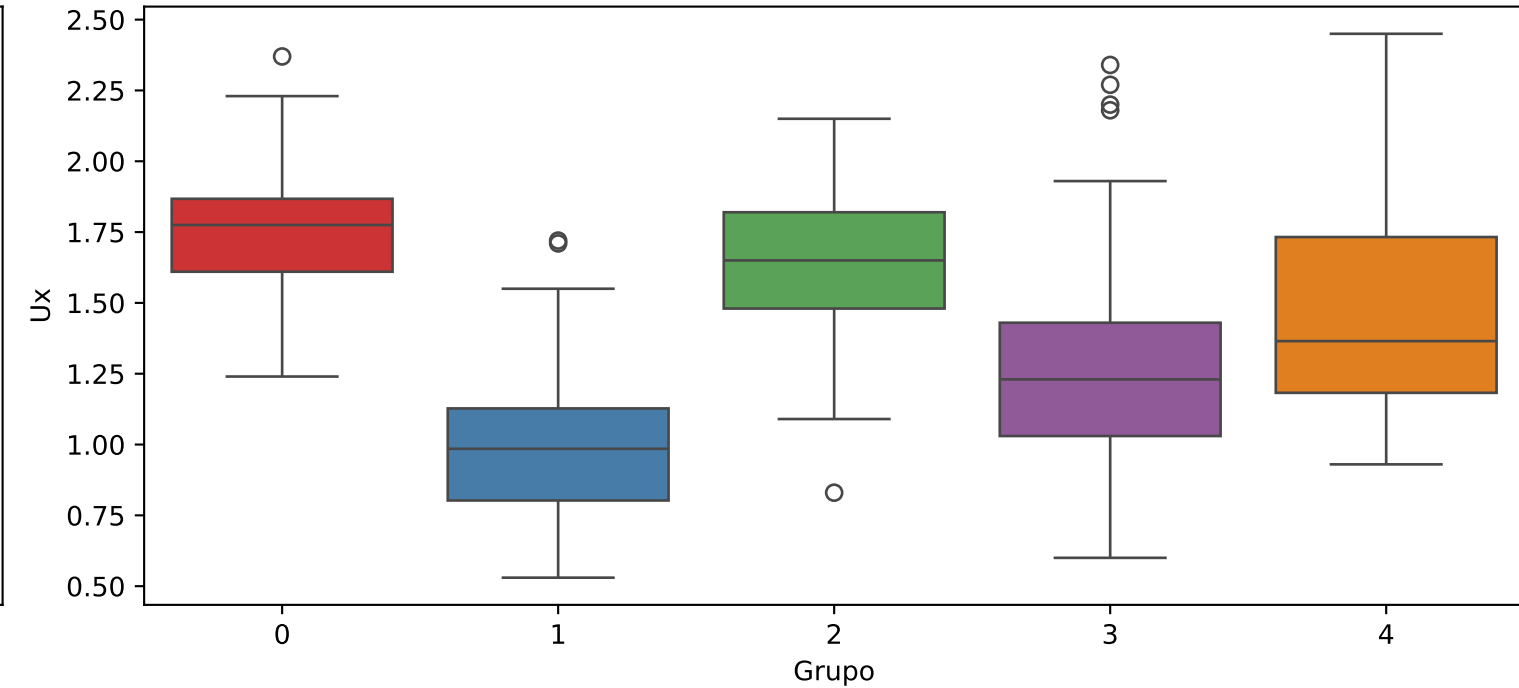
Distribución de Tmin por grupo



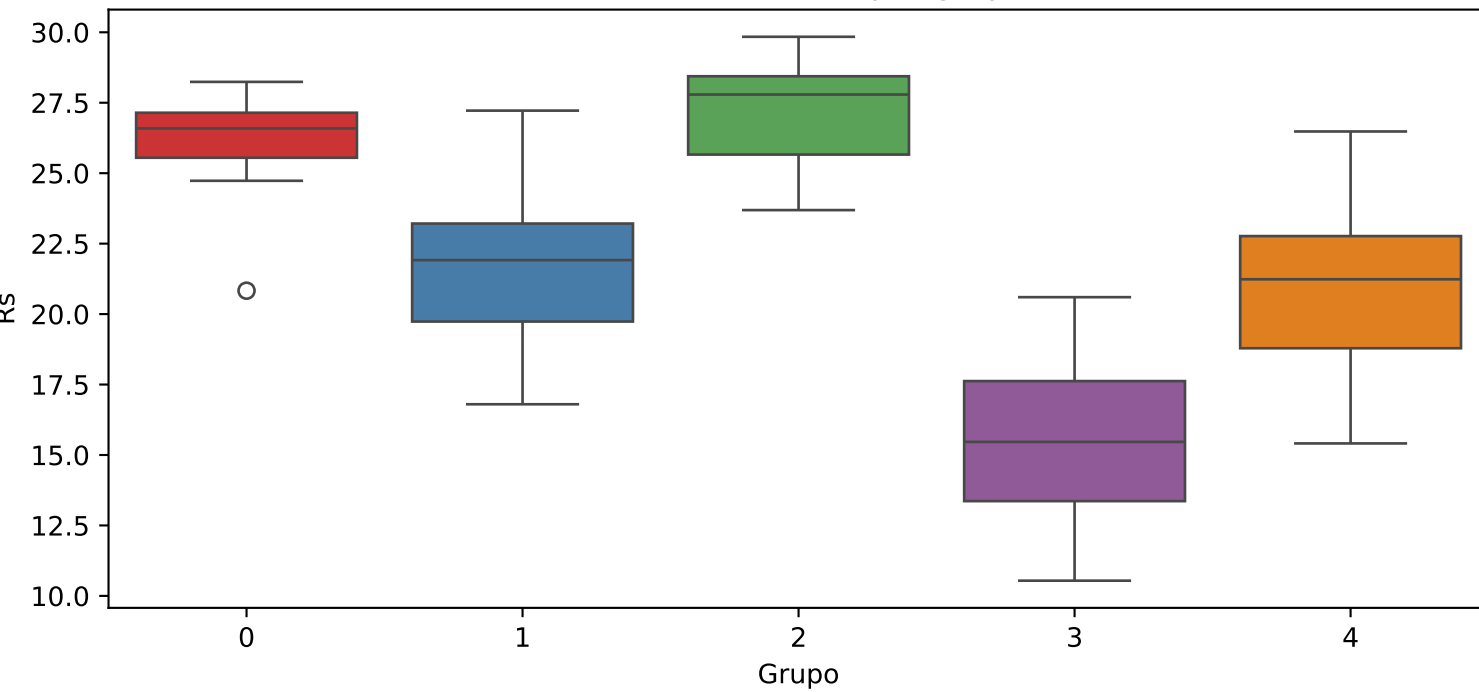
Distribución de HR por grupo



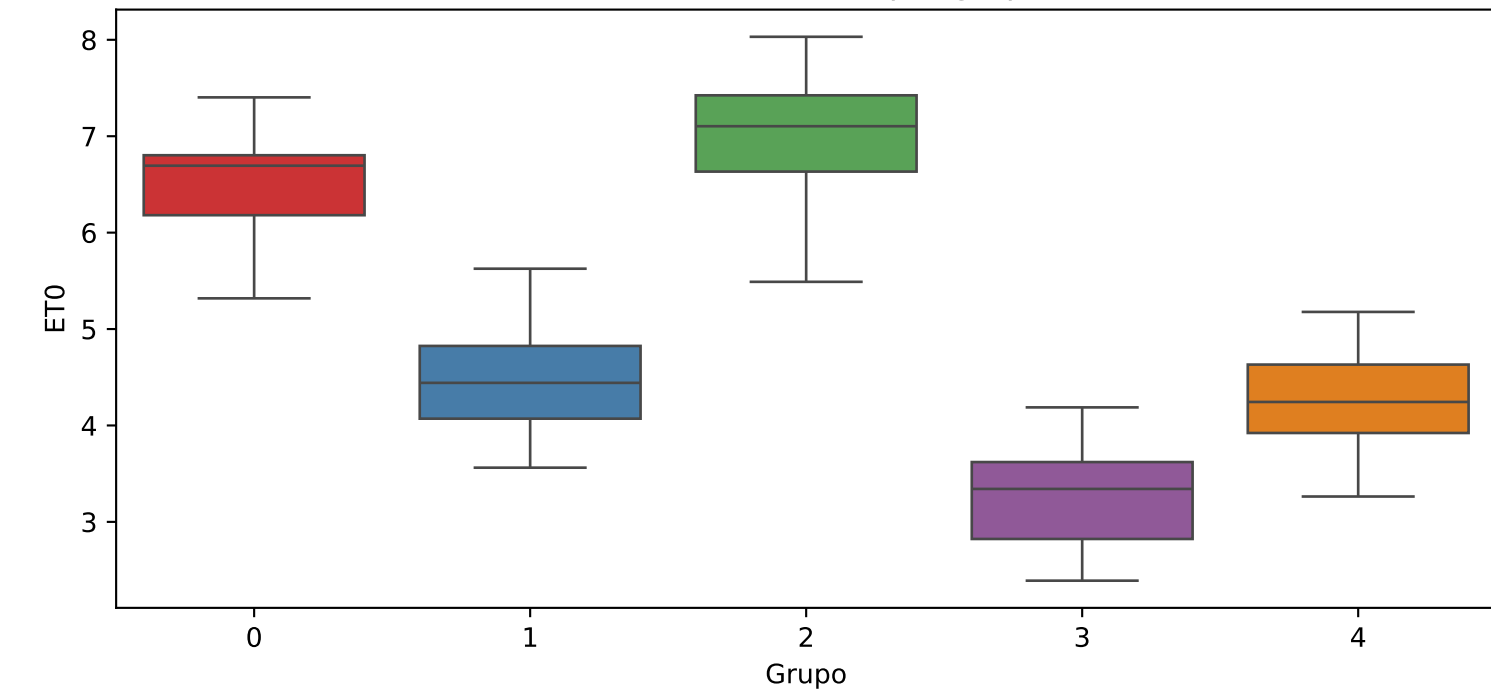
Distribución de Ux por grupo



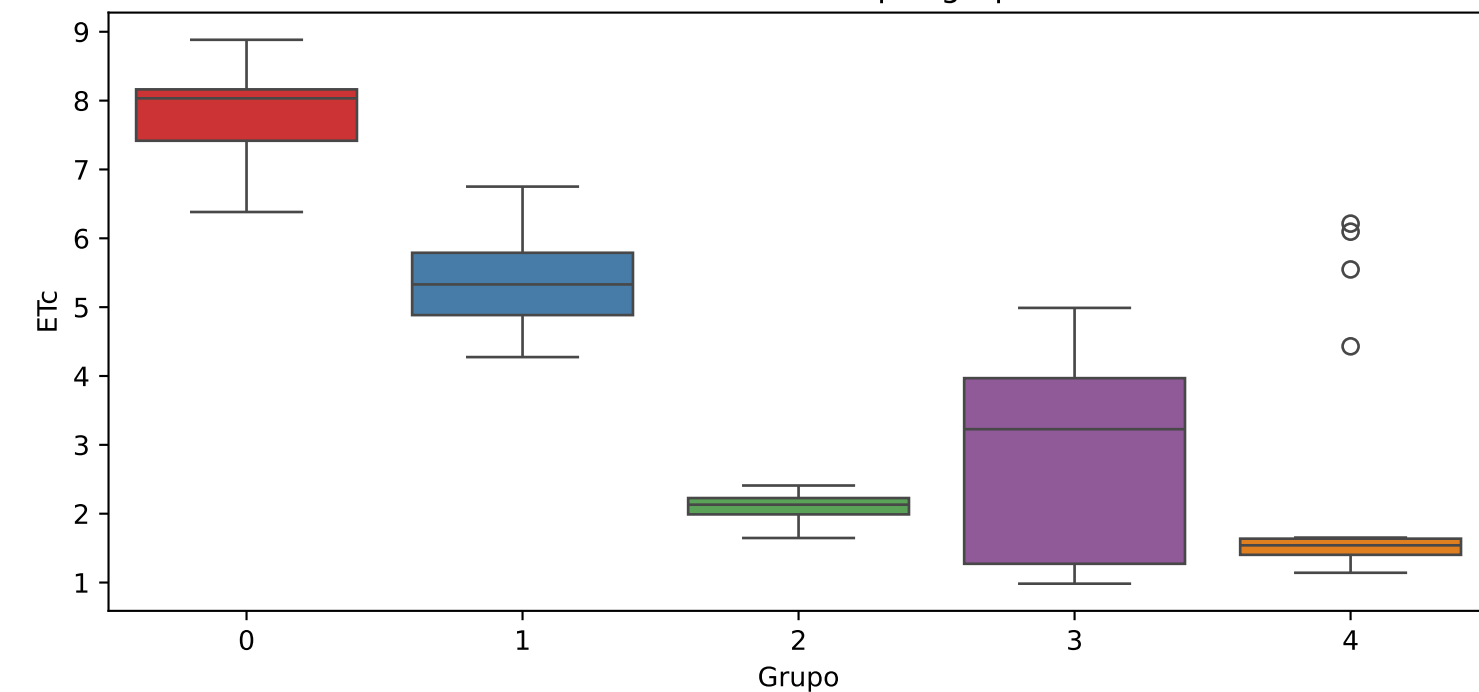
Distribución de Rs por grupo



Distribución de ET0 por grupo

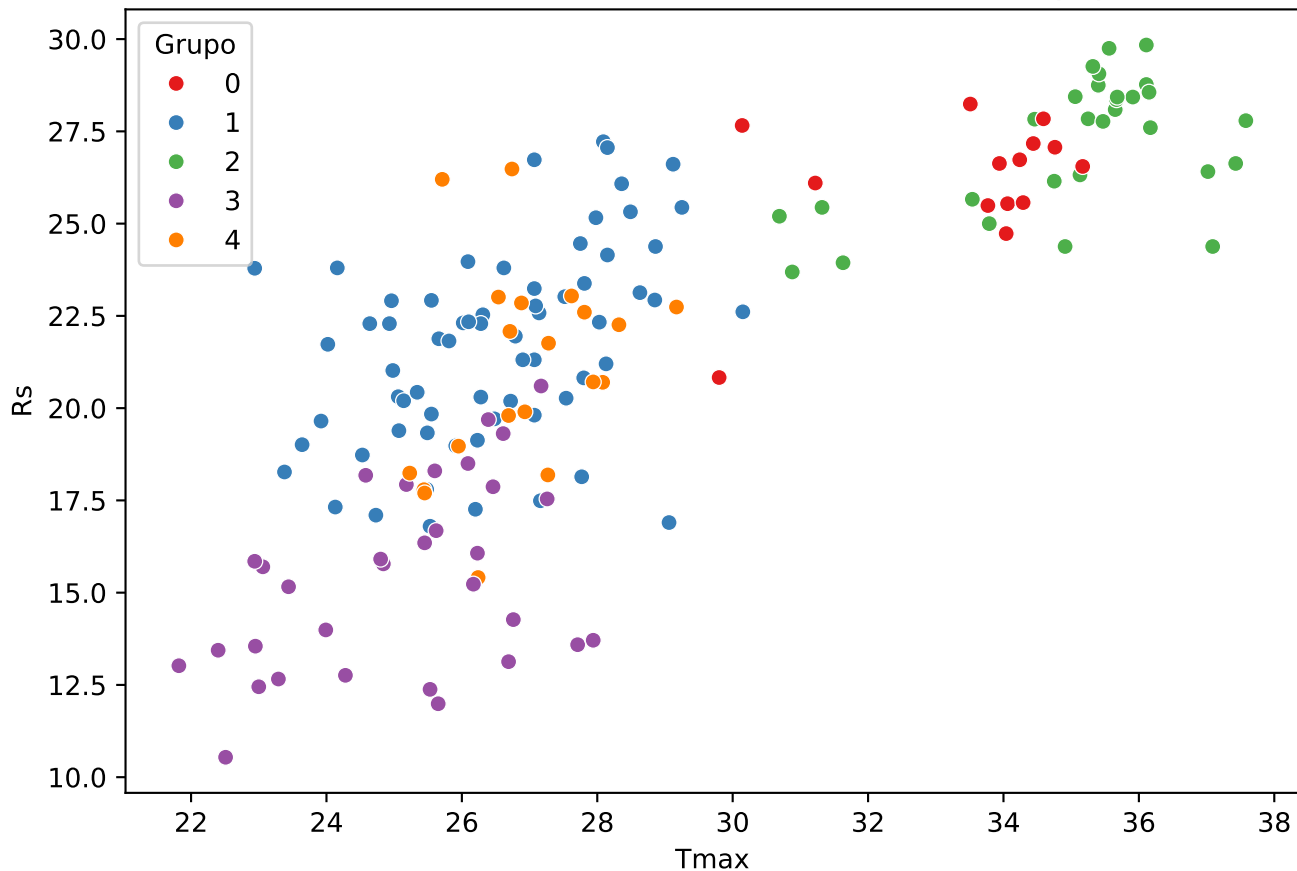


Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2017)



## **Zapopan — 2018**

Días del ciclo: 161

ETc total [mm]: 641.4

ETverde total [mm]: 348.7

ETazul total [mm]: 292.7

Tmax / Tmin [°C]: 37.7 / 12.3

## Zapopan — 2018 · Resultados y métricas

[Zapopan 2018] Regresión Lineal ET0 —  $R^2$ : 0.9926 MSE: 0.0139

[Zapopan 2018] Random Forest ET0 —  $R^2$ : 0.9861 MSE: 0.0259

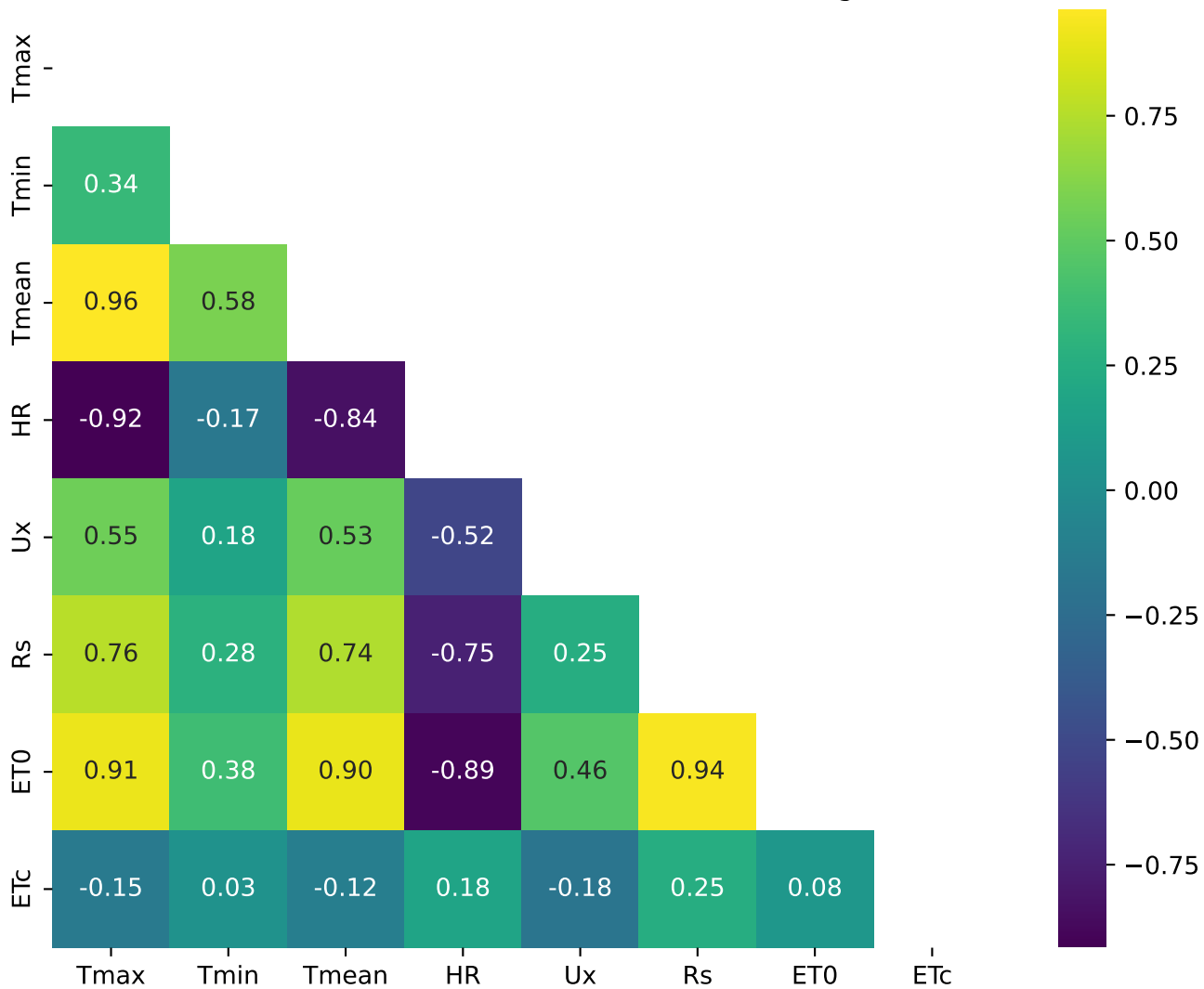
Importancias: {'Tmax': 0.14257827139173246, 'Tmin': 0.00308620511289948, 'HR': 0.10685079674296057, 'Ux': 0.005836595435420806, 'Rs': 0.7416481313169867}

Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	27.754167	16.849722	72.284167	1.126111	25.385556	5.311397	6.238615
1	34.733750	15.410000	34.808750	1.488750	29.658750	7.256685	2.177006
2	35.114375	18.913125	50.985000	1.695625	27.555625	6.983815	2.095144
3	25.144167	15.698611	80.583889	1.086111	17.562222	3.540738	1.533724
4	25.165846	16.579385	80.761077	1.062308	19.696769	4.034476	4.778982

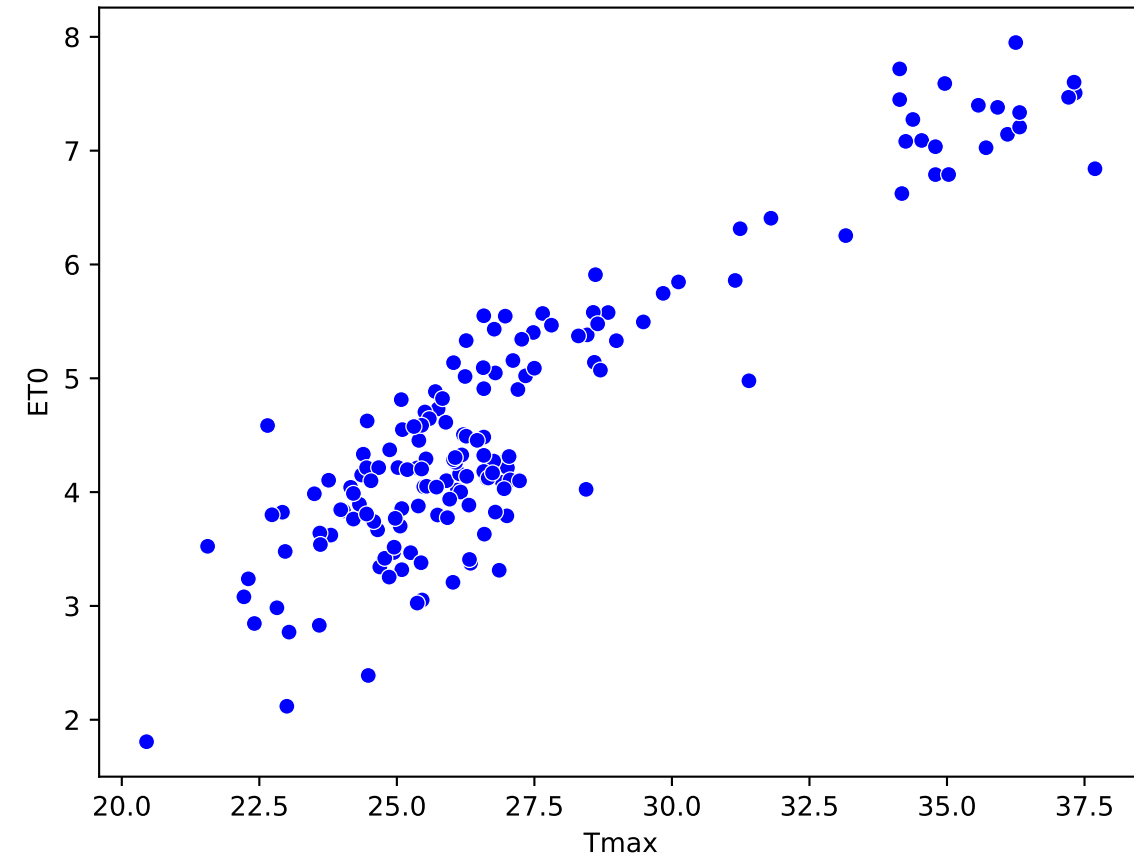
**Zapopan — 2018**

Matriz de Correlación entre Variables Meteorológicas

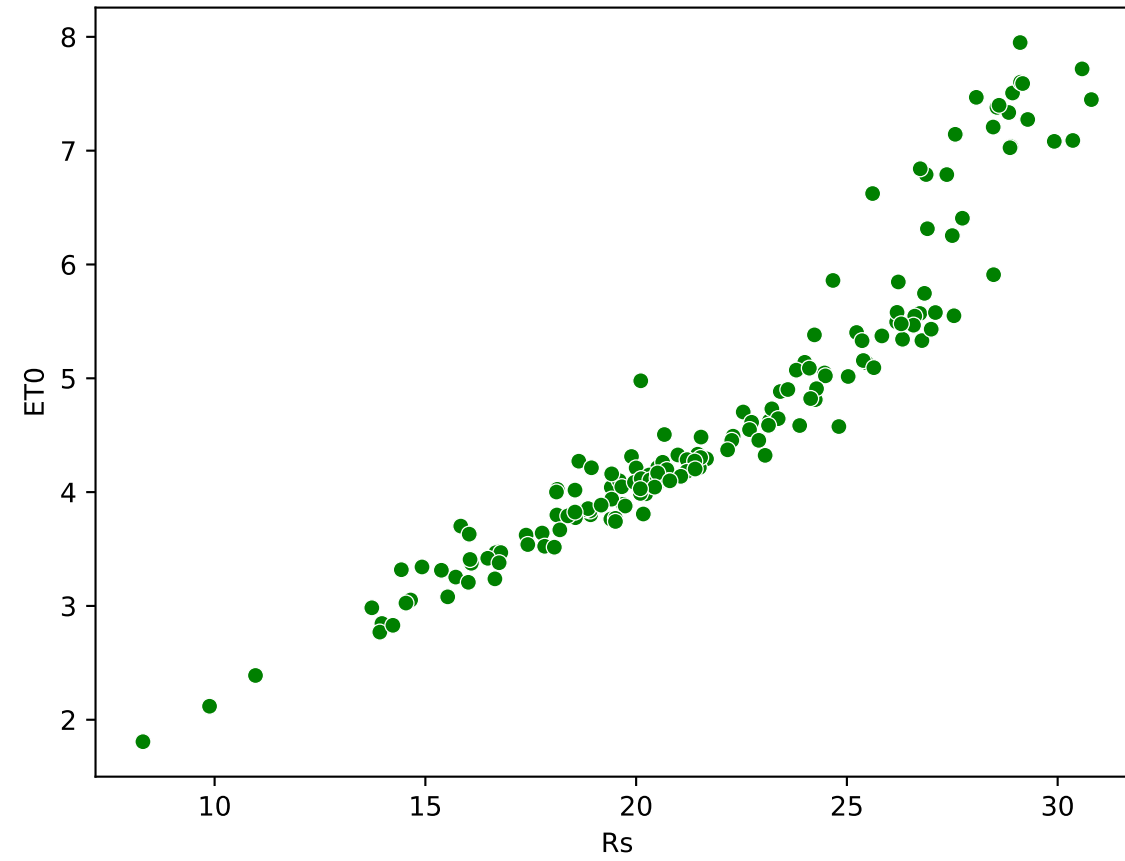


# Dispersión — Zapopan (2018)

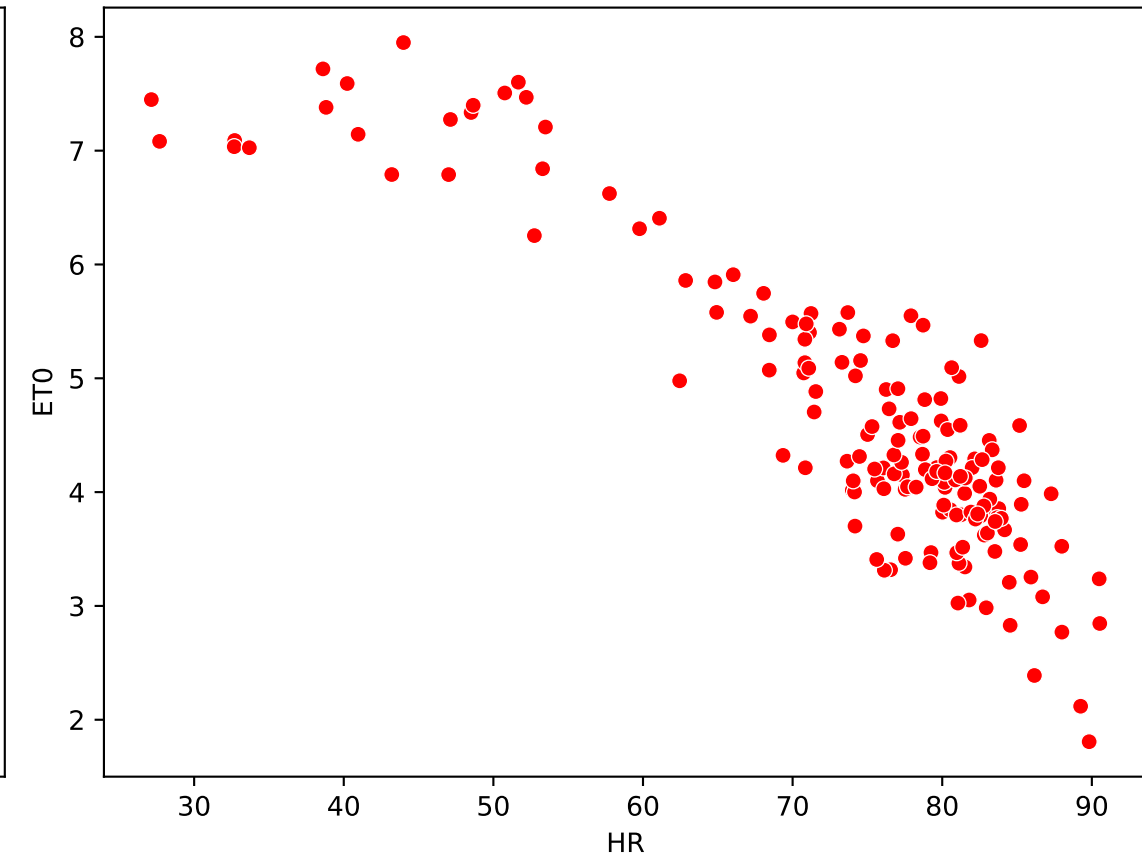
## Tmax vs ET0



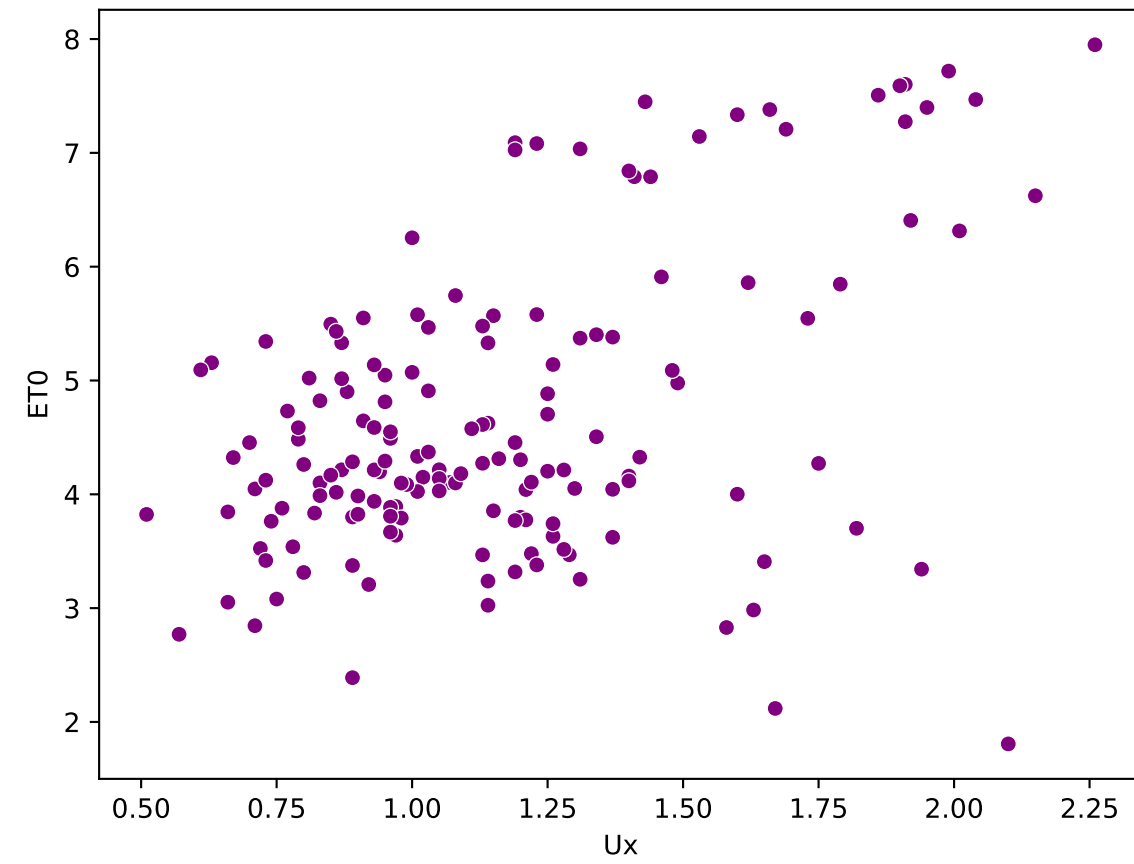
## Rs vs ET0



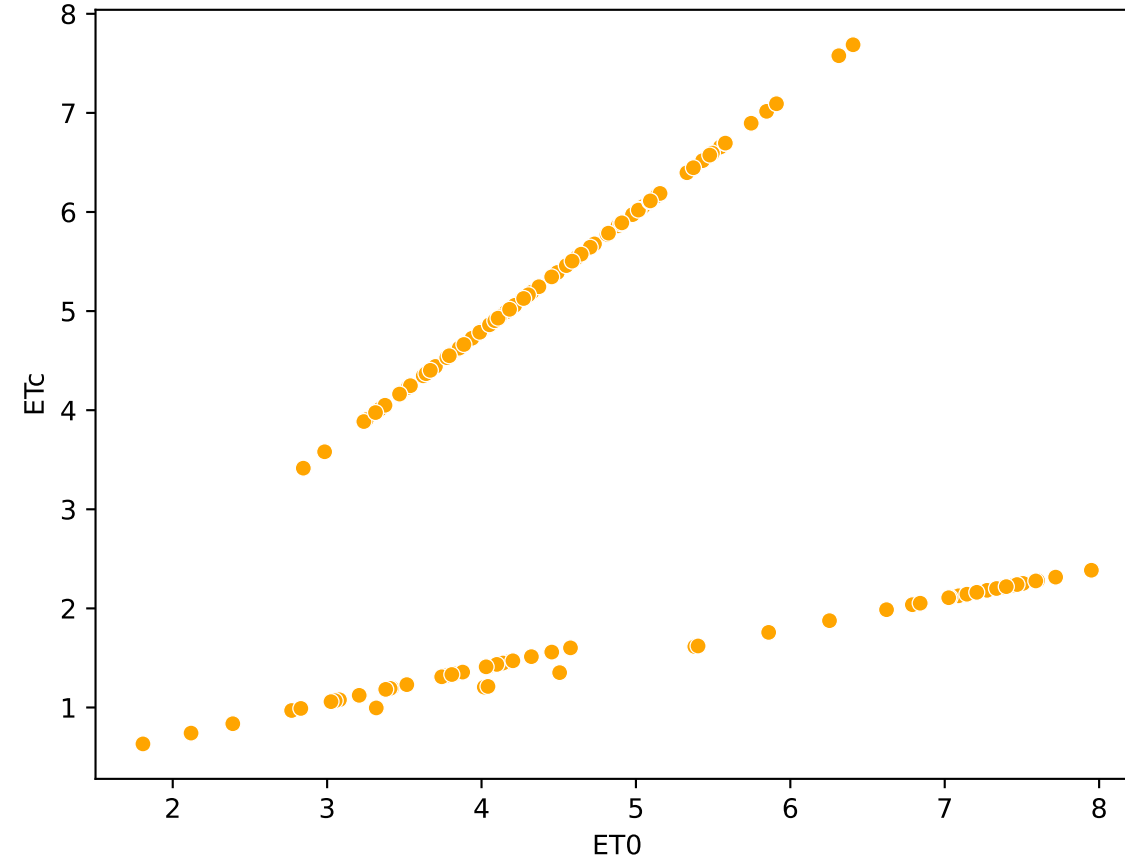
## HR vs ET0



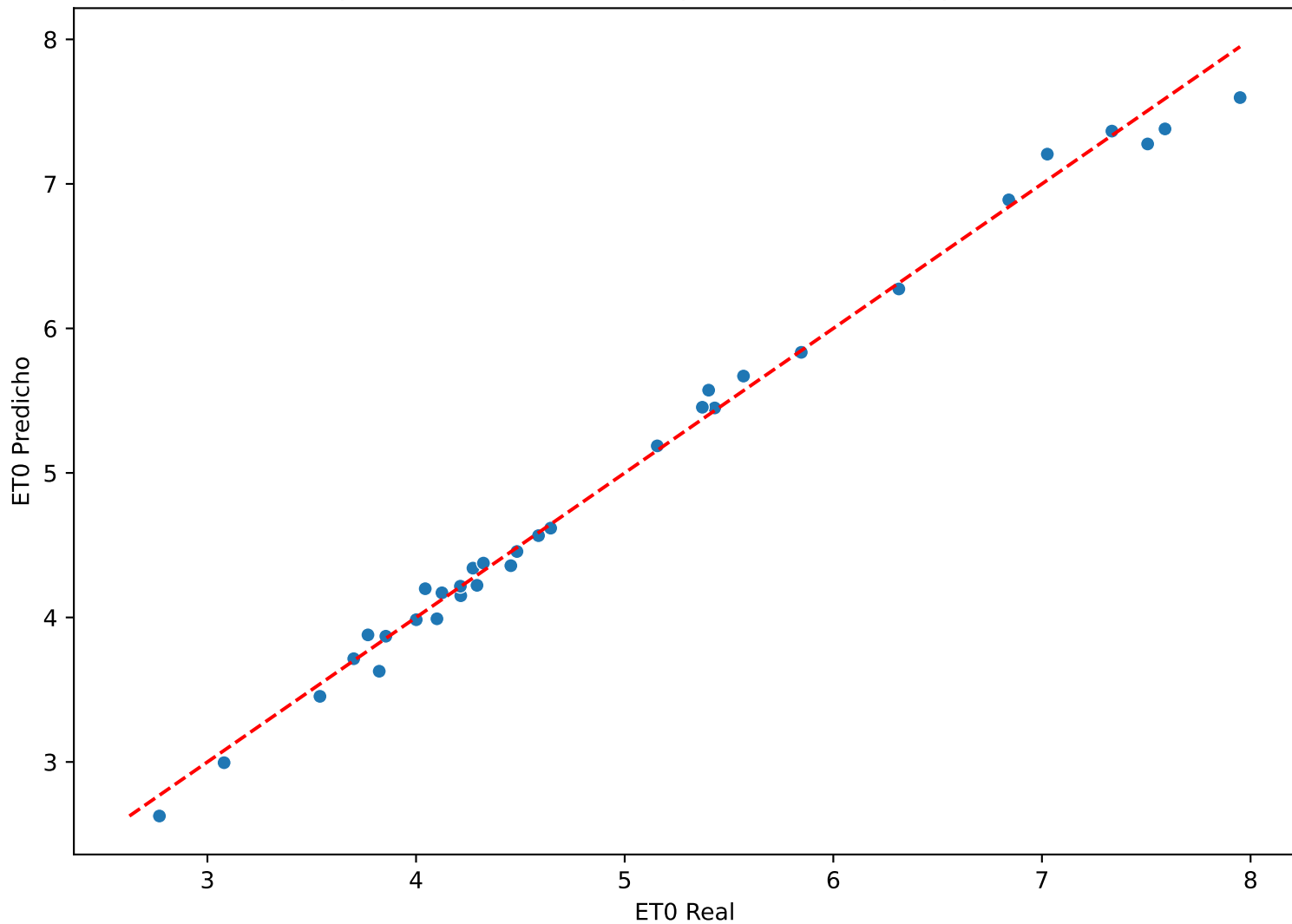
## Ux vs ET0



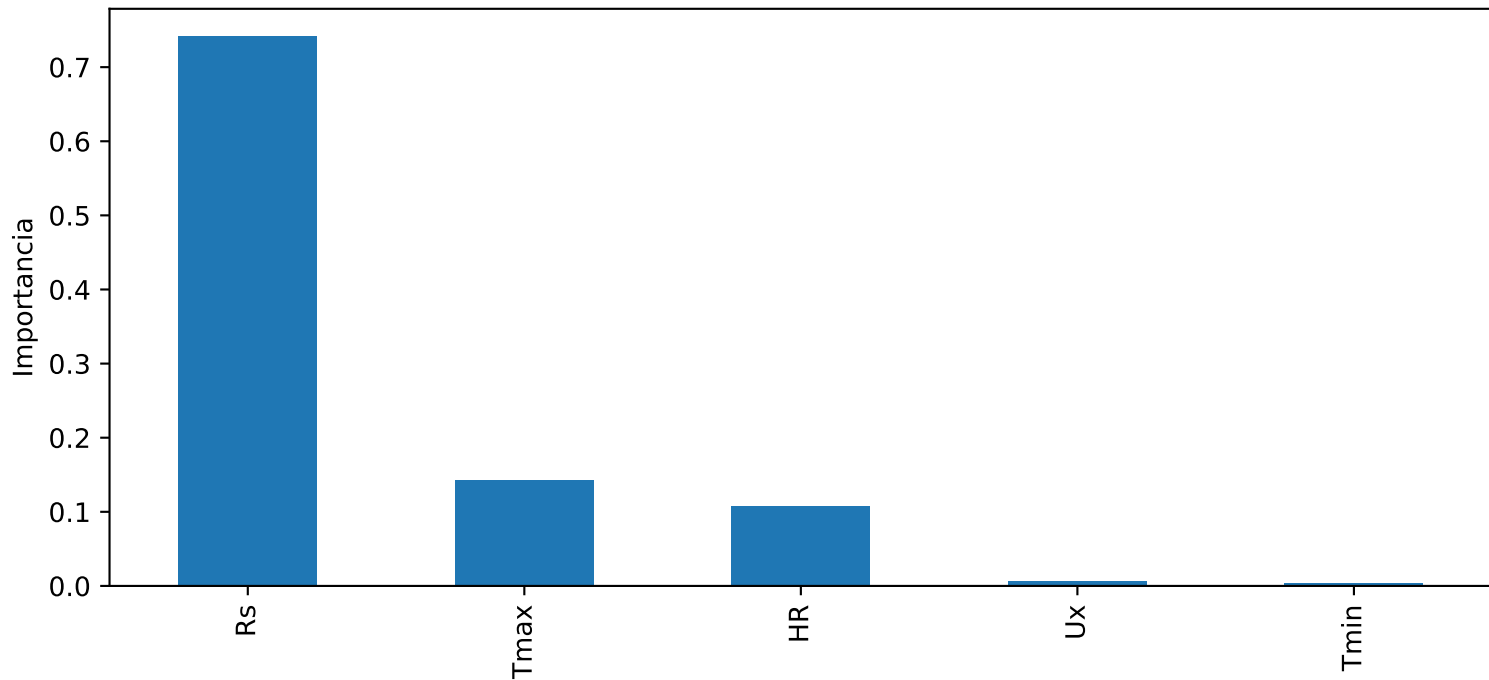
## ET0 vs ETc



Comparación entre ET0 Real y Predicho — Zapopan (2018)

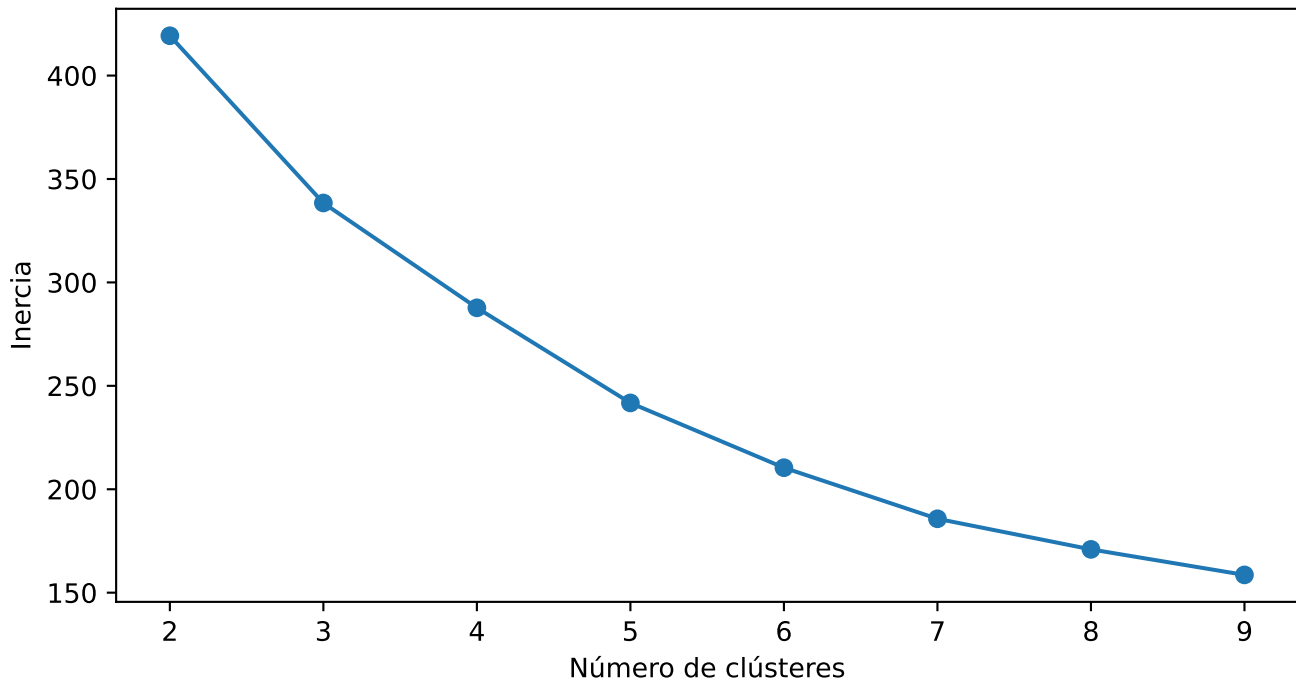


Importancia de variables (RF) — Zapopan (2018)

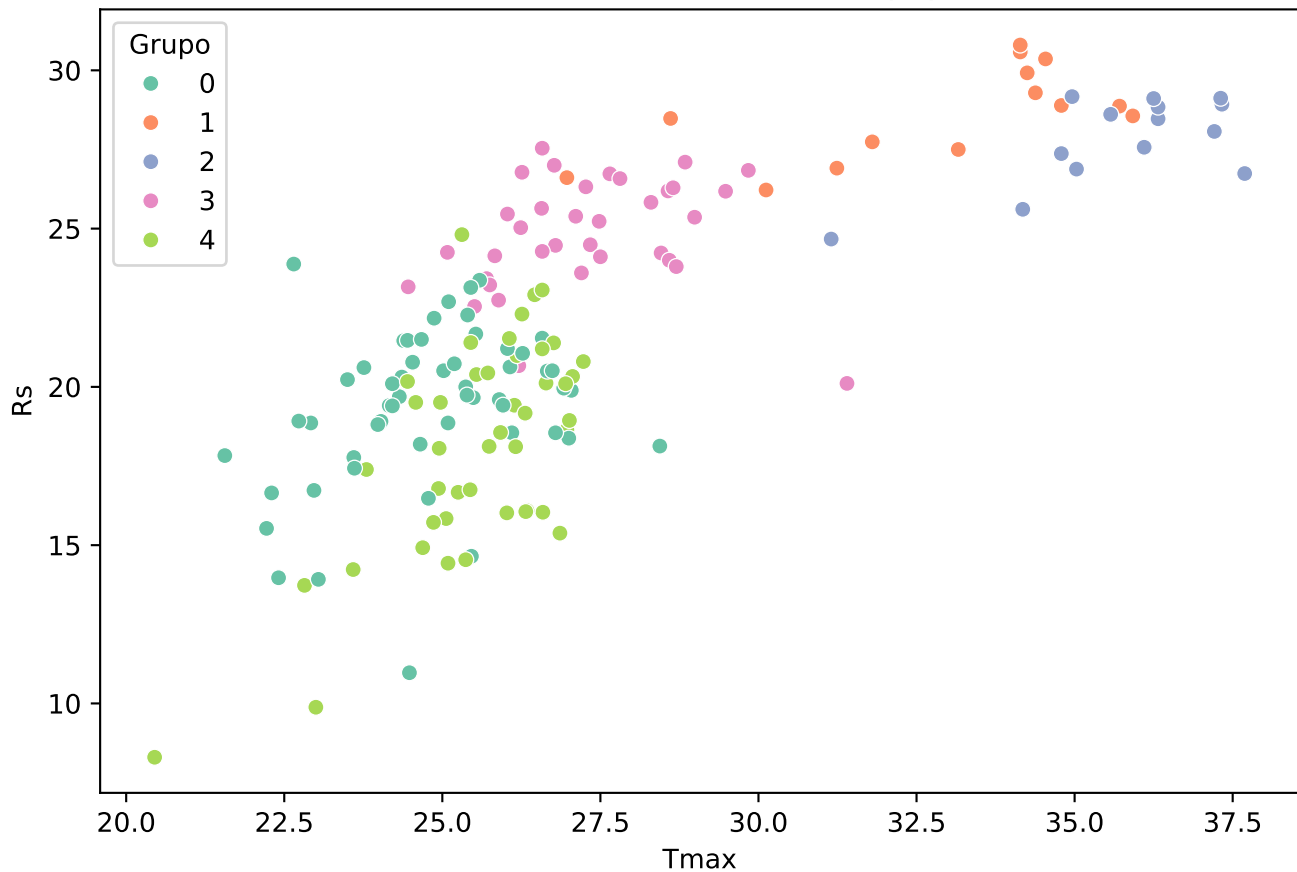




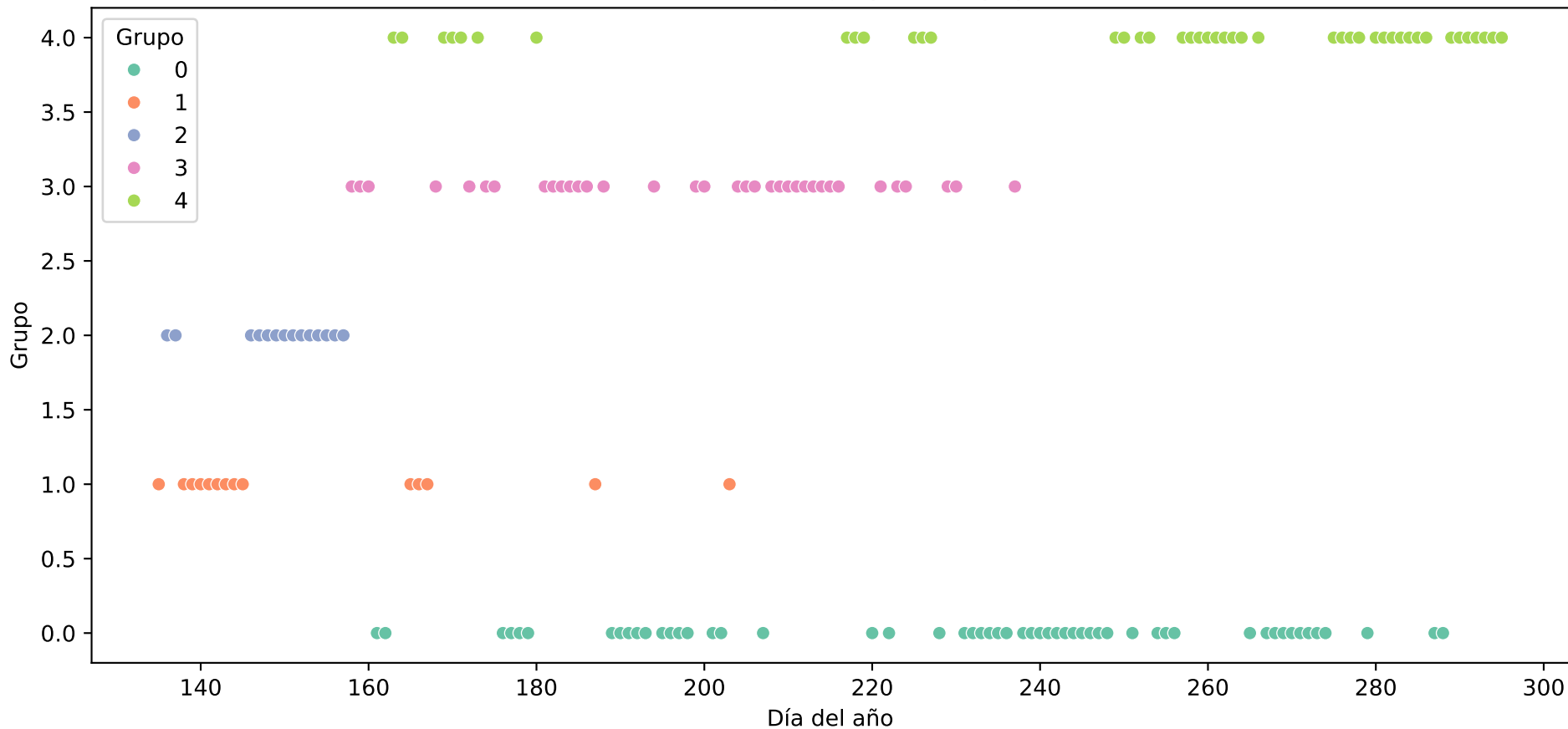
## Método del codo



Clasificación de días climáticos — Zapopan (2018)

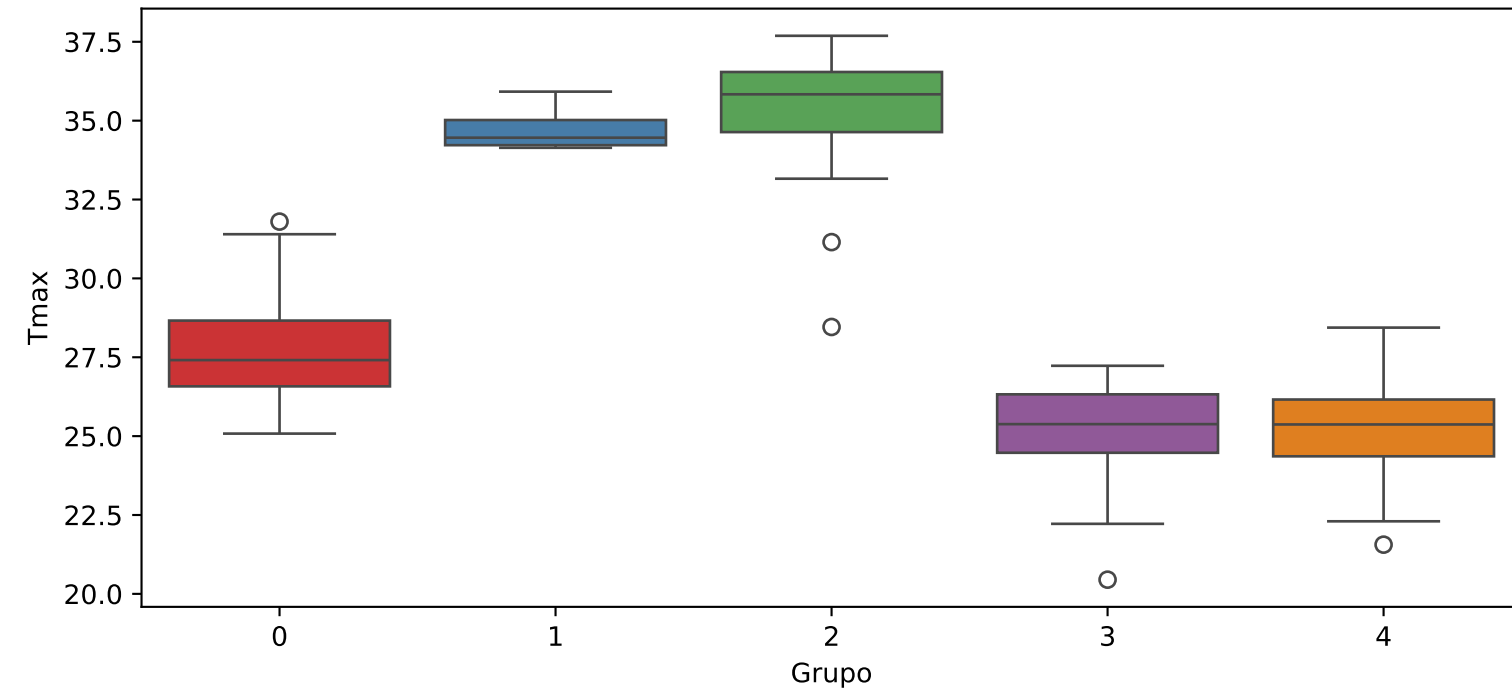


Distribución de días por grupo — Zapopan (2018)

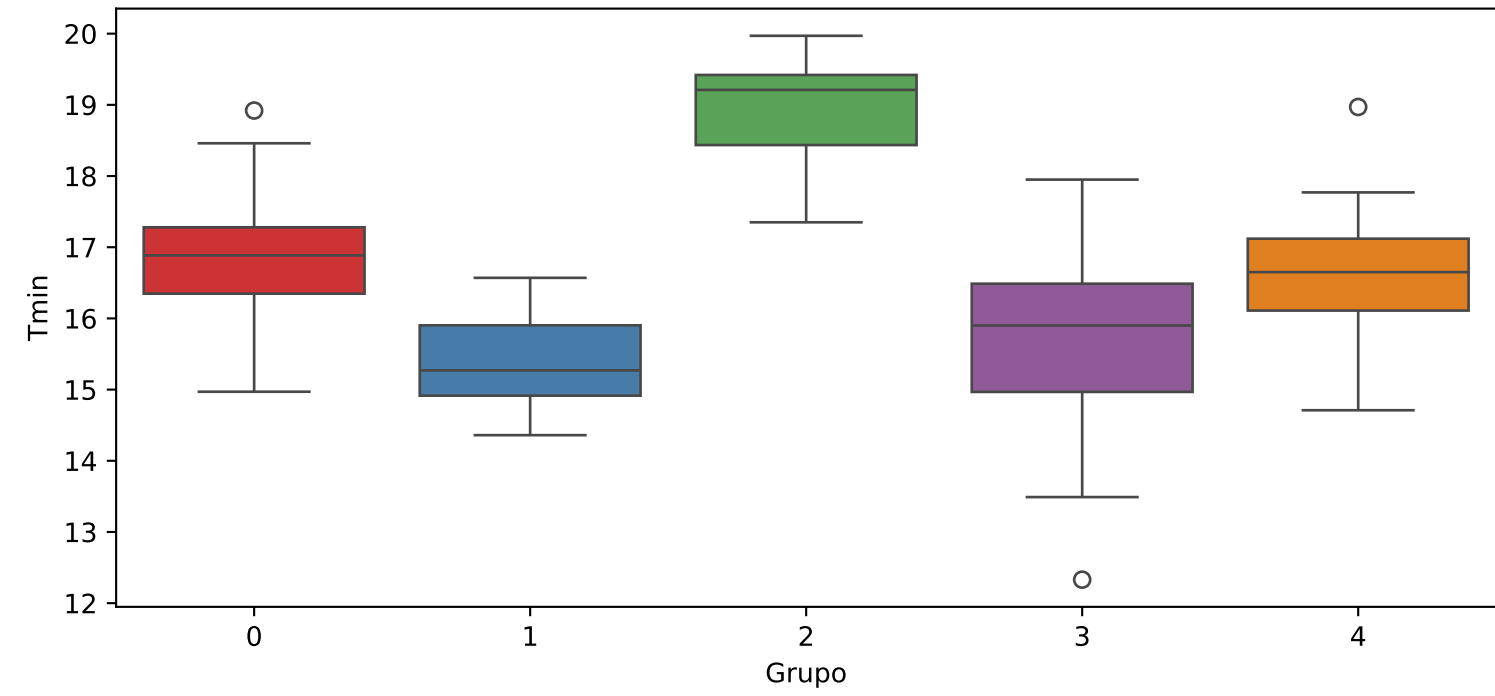


# Boxplots por grupo — Zapopan (2018)

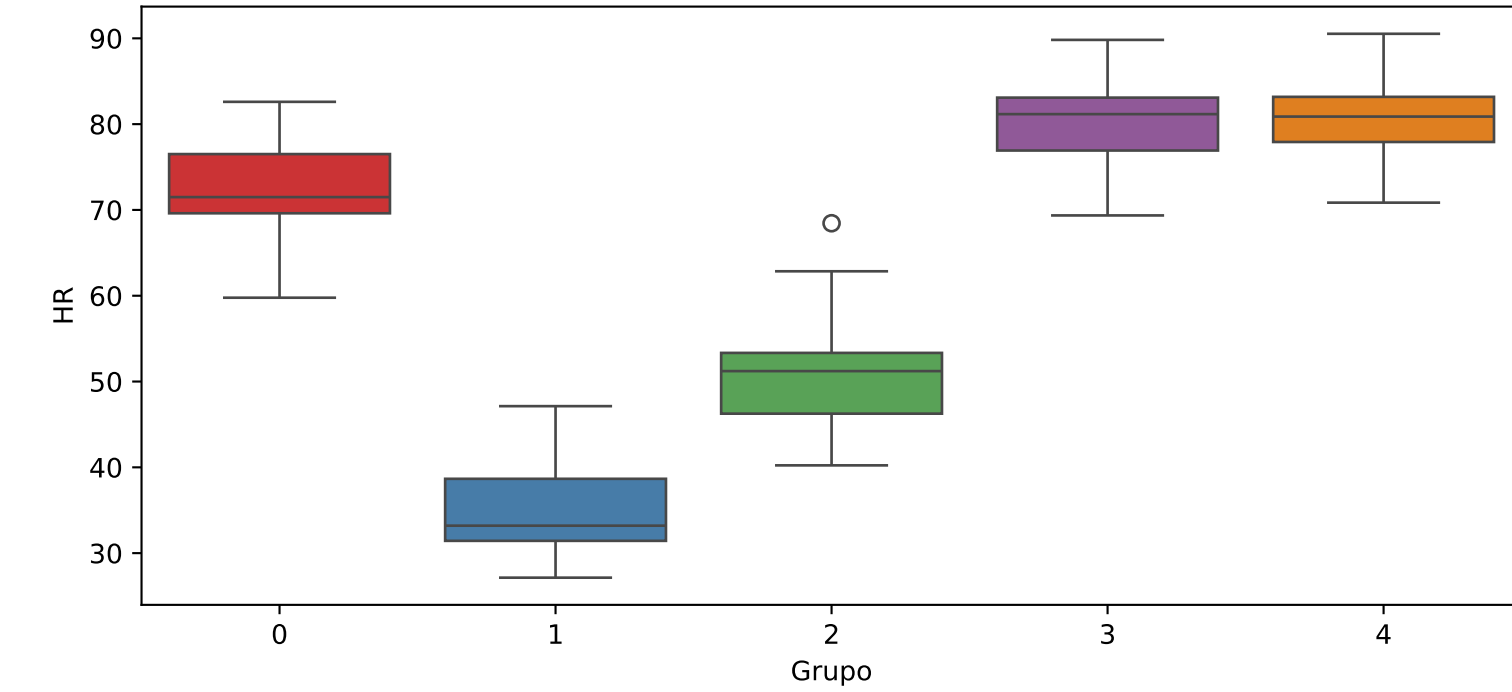
## Distribución de Tmax por grupo



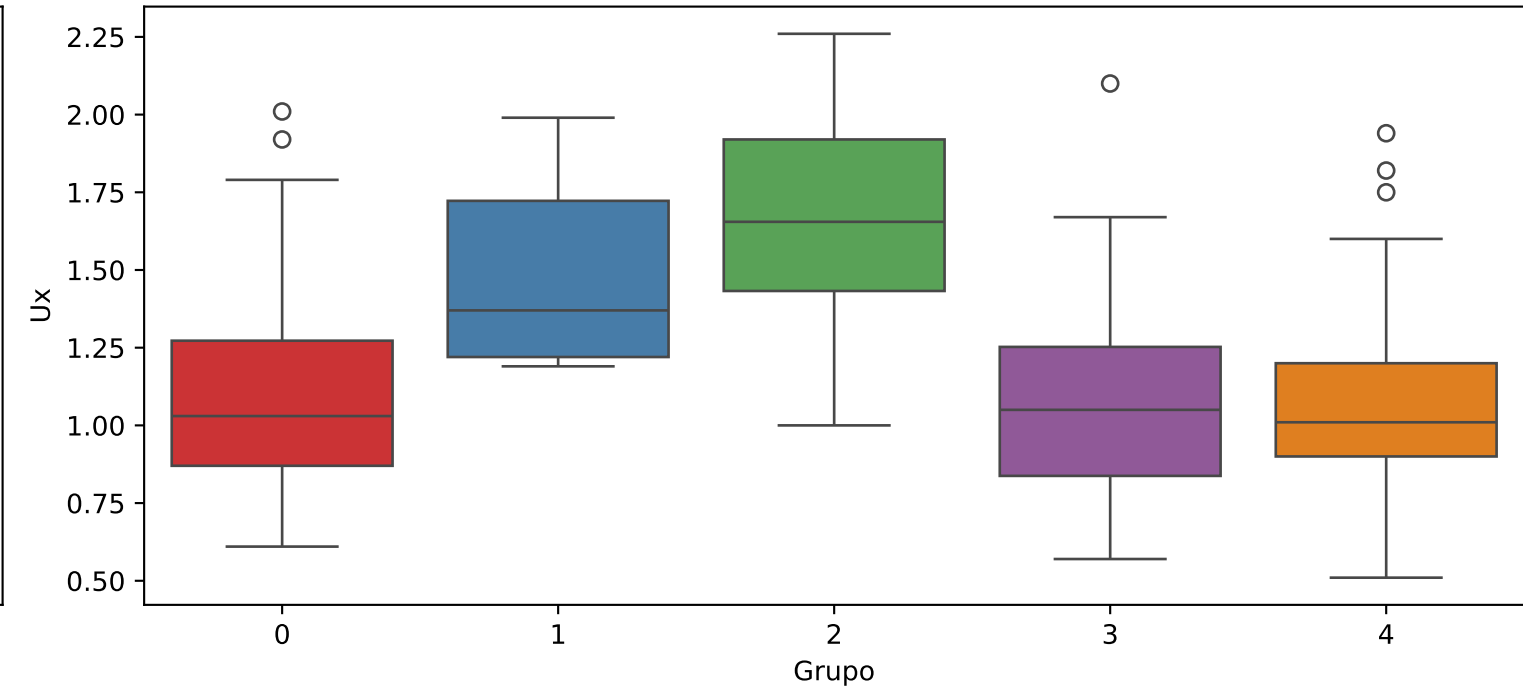
## Distribución de Tmin por grupo



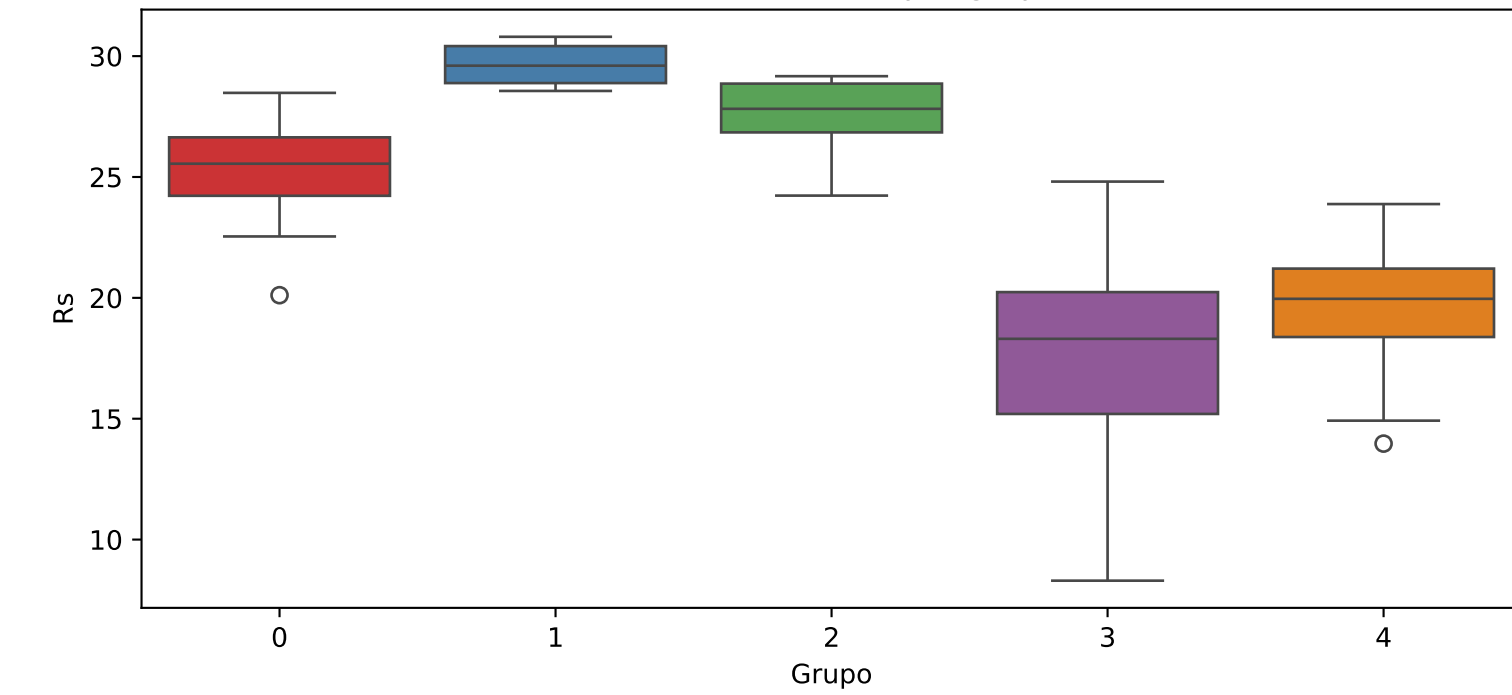
## Distribución de HR por grupo



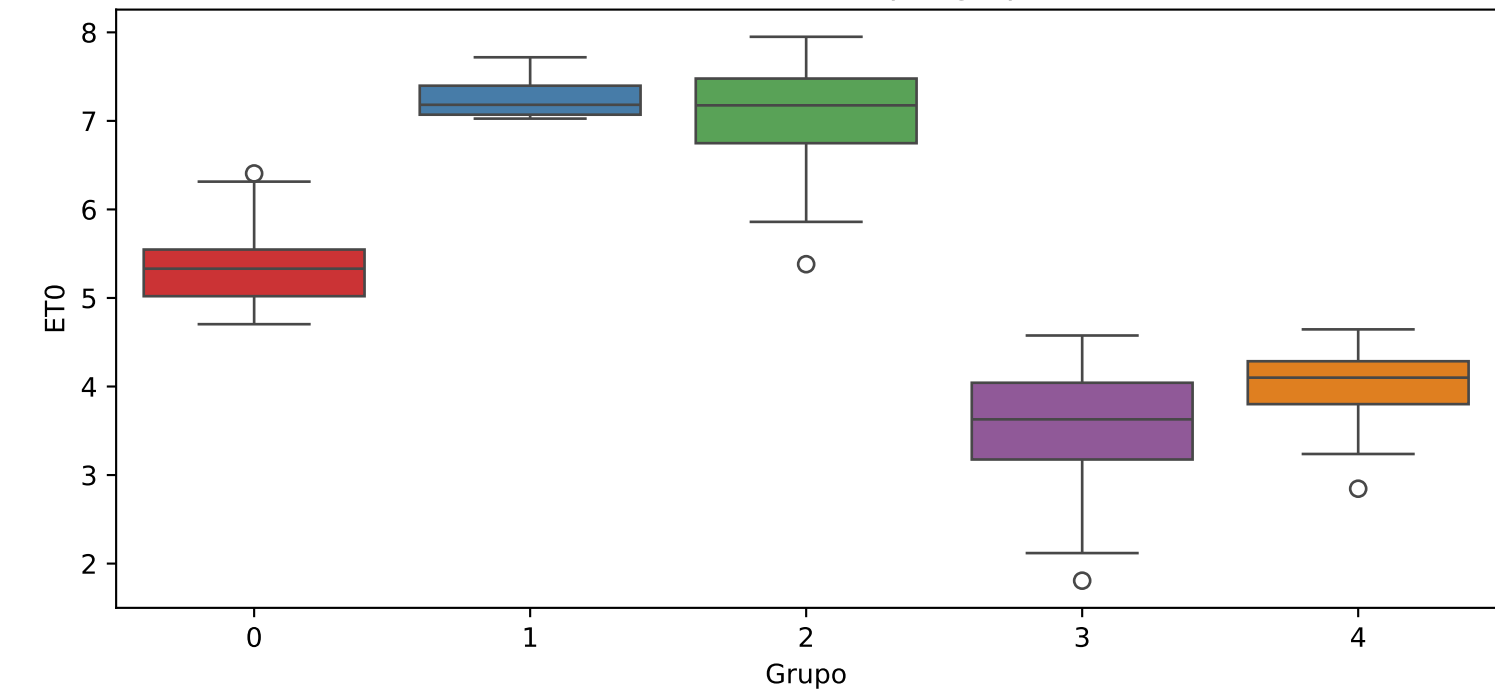
## Distribución de Ux por grupo



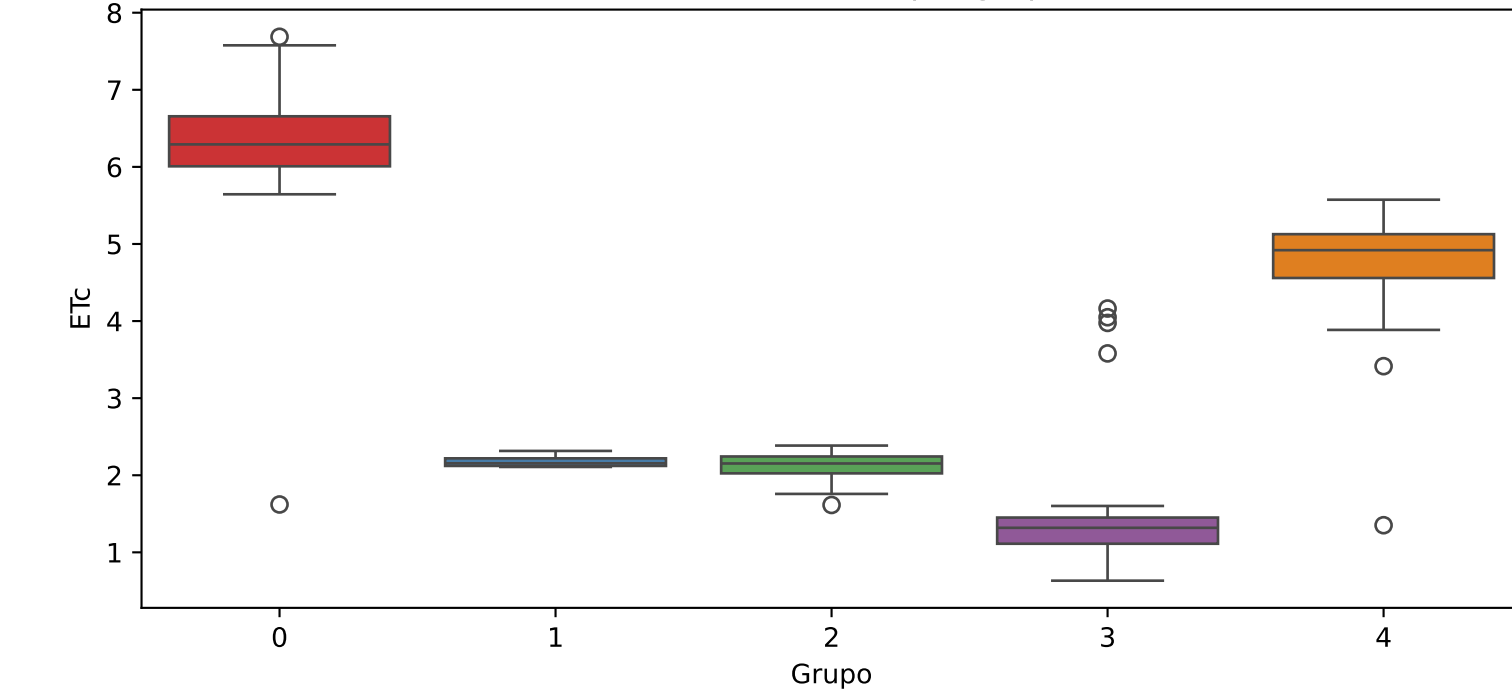
## Distribución de Rs por grupo



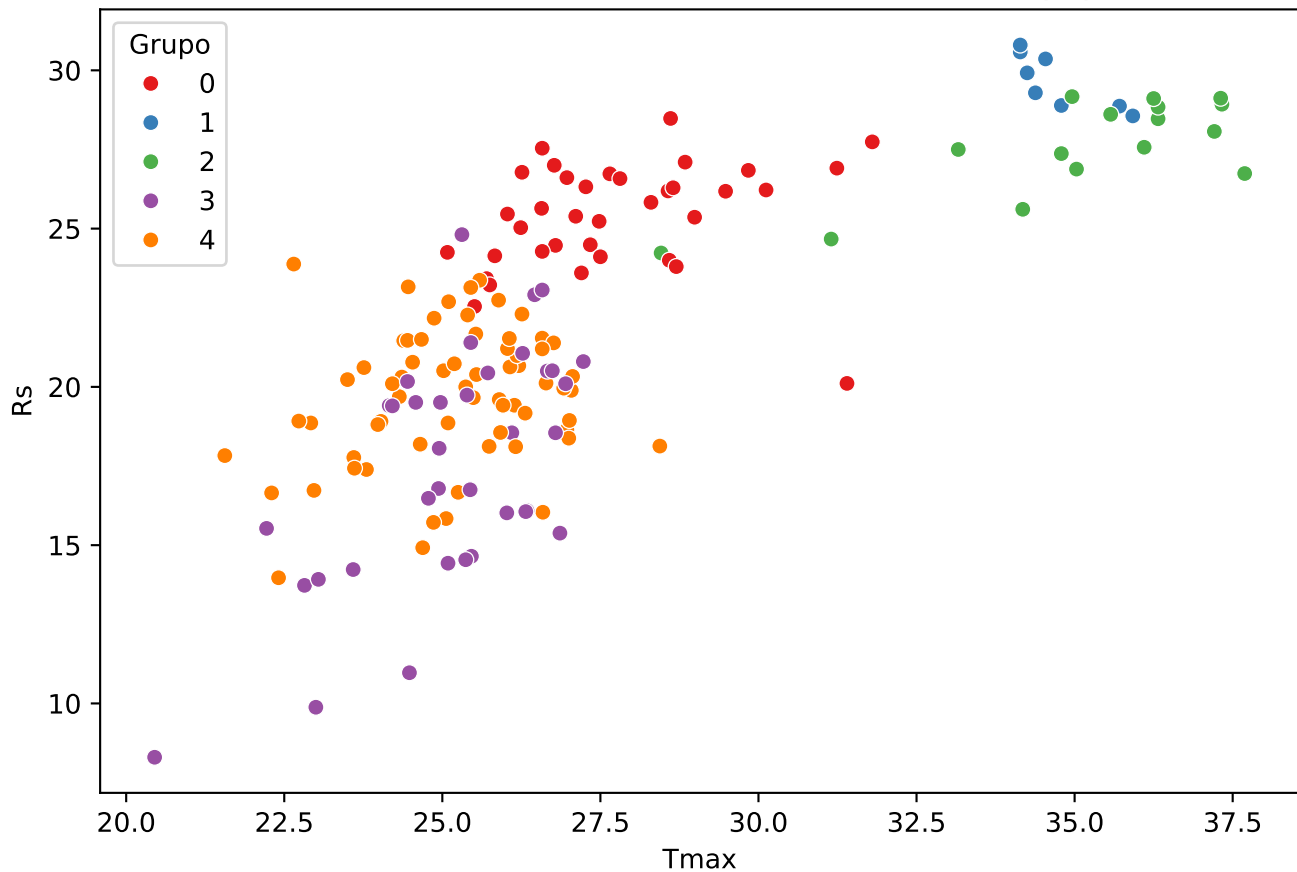
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2018)



## **Zapopan — 2019**

Días del ciclo: 161

ETc total [mm]: 688.6

ETverde total [mm]: 325.1

ETazul total [mm]: 363.5

Tmax / Tmin [°C]: 36.4 / 13.1

## Zapopan — 2019 · Resultados y métricas

[Zapopan 2019] Regresión Lineal ET0 —  $R^2$ : 0.9833 MSE: 0.0184

[Zapopan 2019] Random Forest ET0 —  $R^2$ : 0.9775 MSE: 0.0248

Importancias: {'Tmax': 0.5597861169099954, 'Tmin': 0.004763640159112496, 'HR': 0.13548443293503296, 'Ux': 0.01712351087096845, 'Rs': 0.2828422991248908}

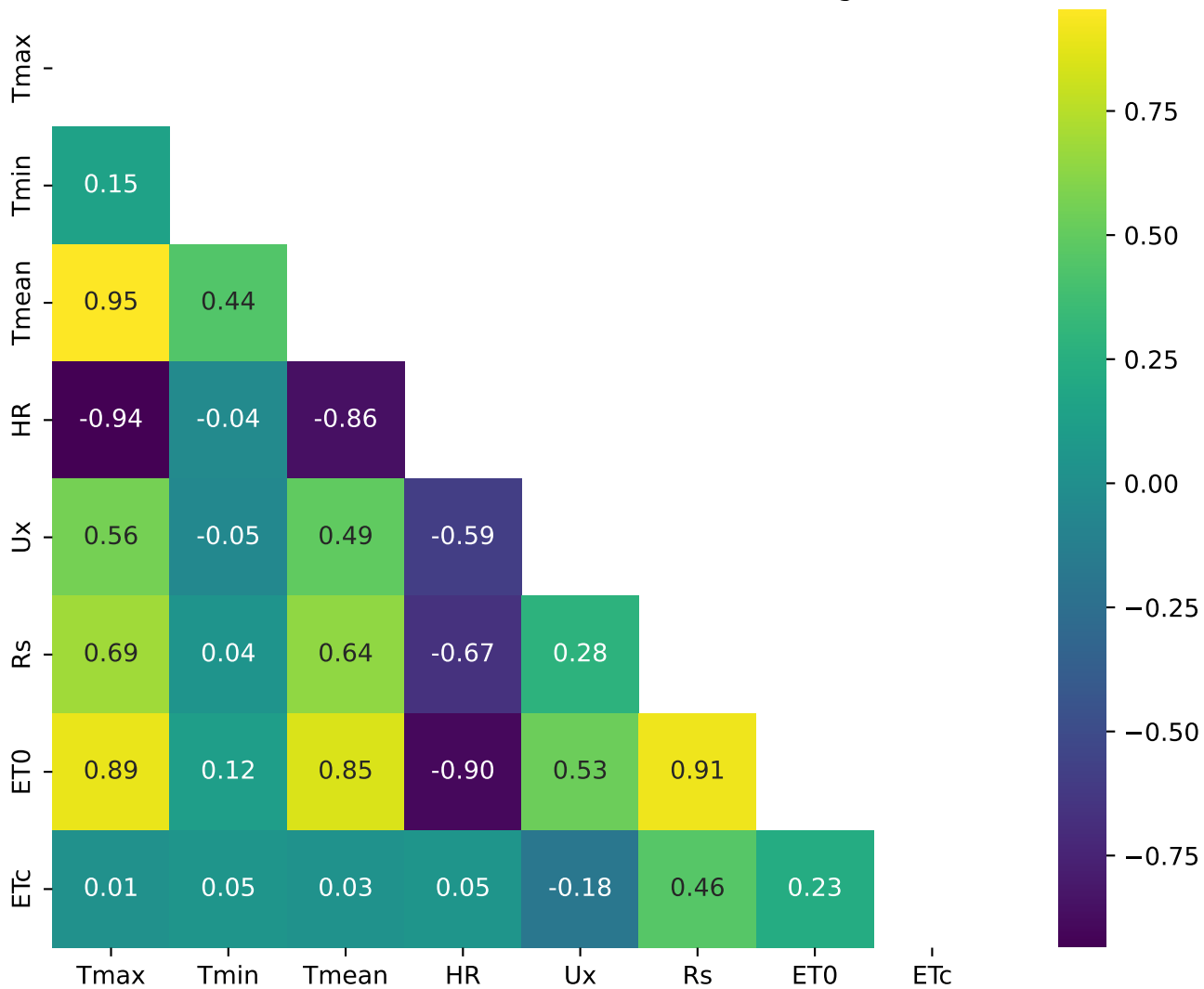
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	31.797917	17.919167	57.411667	1.372917	25.344583	5.976732	6.967945
1	26.230417	17.630625	79.438125	0.972708	19.031667	4.003099	3.228418
2	27.155532	16.704681	77.020213	1.039574	24.061064	4.908349	5.890019
3	34.886364	17.160909	37.703636	1.784091	26.868182	7.130494	2.139148
4	25.417500	15.545500	80.929000	1.384500	16.479500	3.402053	2.125855

**Zapopan — 2019**

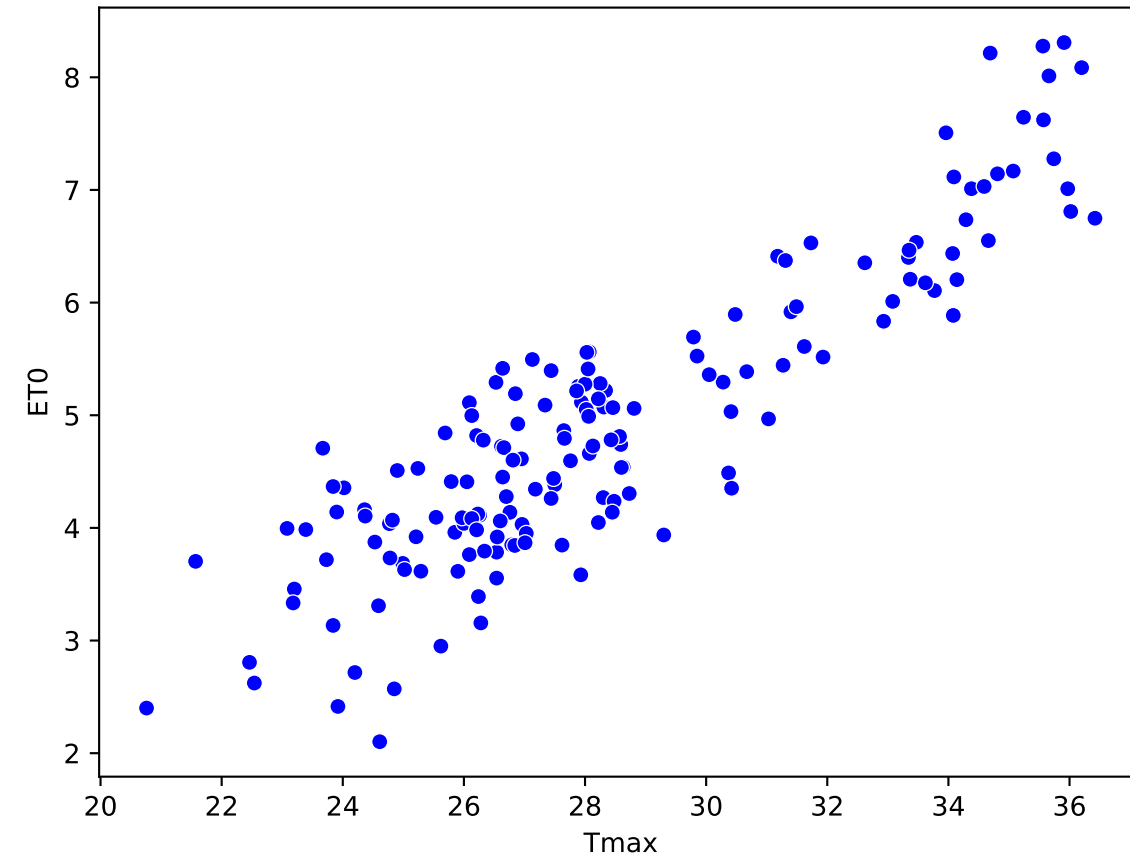


Matriz de Correlación entre Variables Meteorológicas

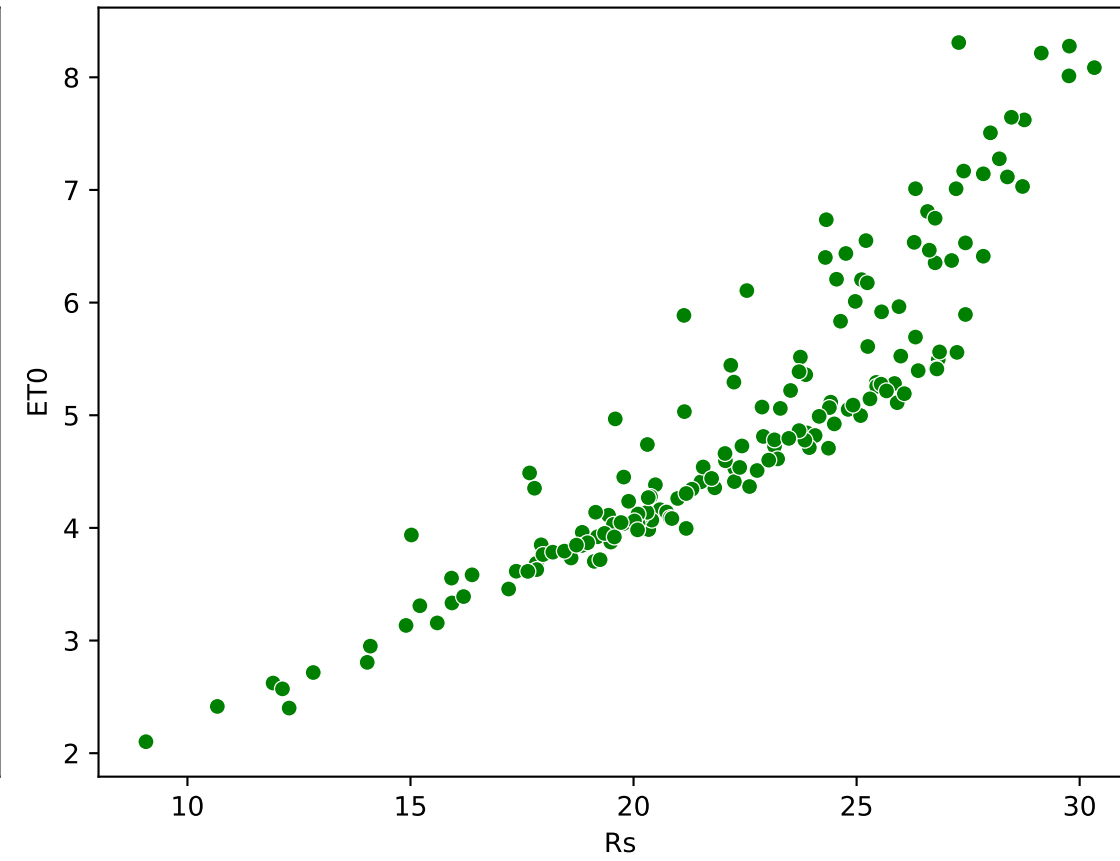


# Dispersión — Zapopan (2019)

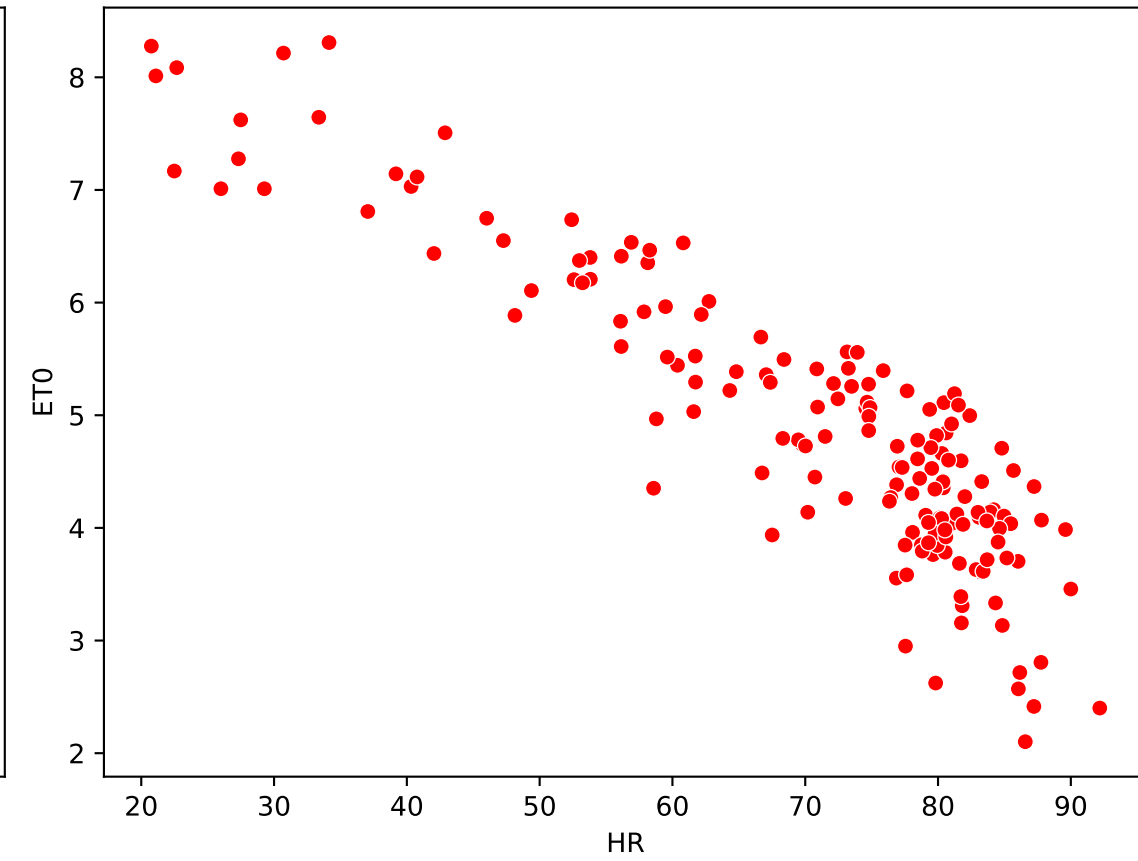
Tmax vs ET0



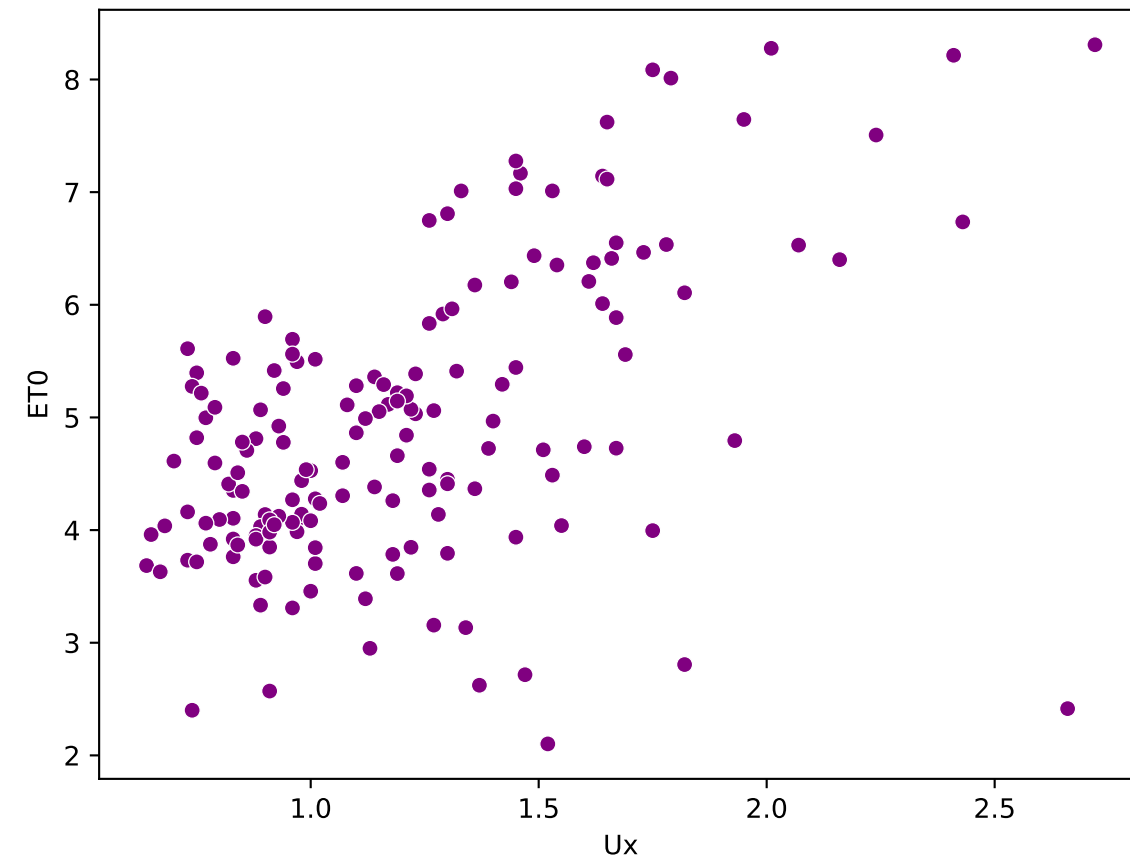
Rs vs ET0



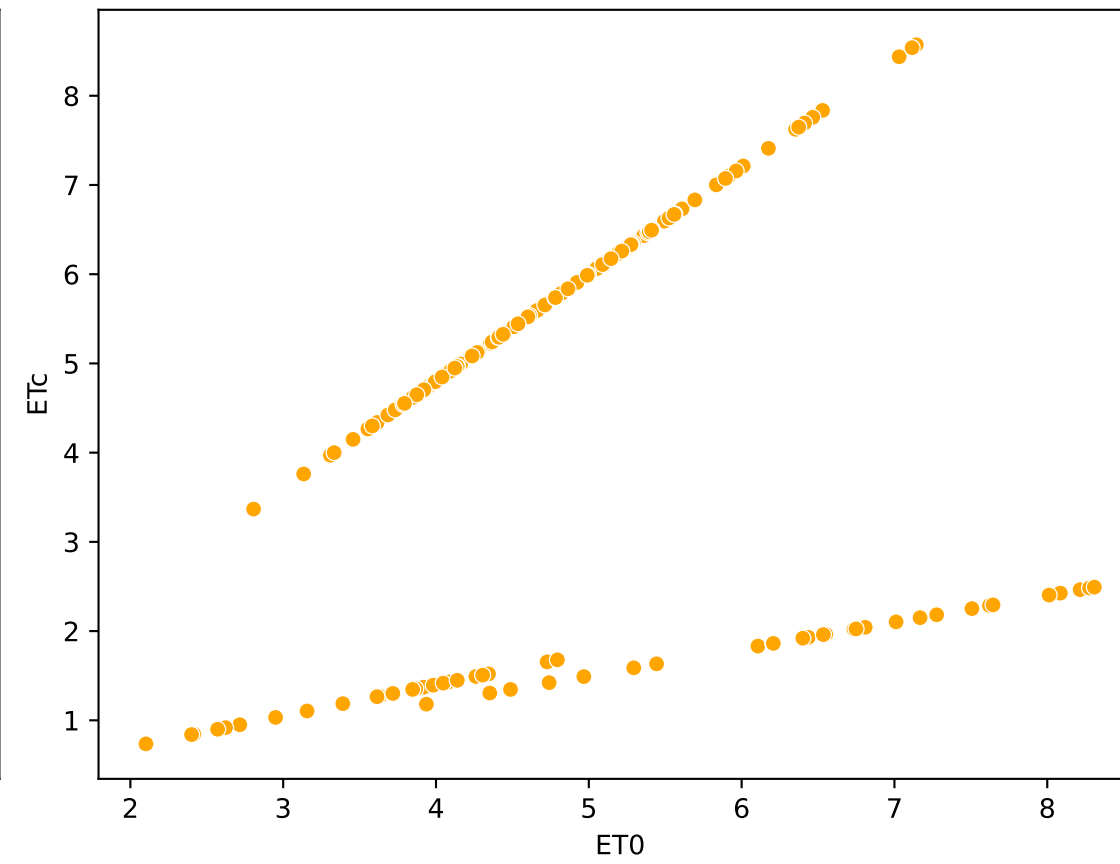
HR vs ET0



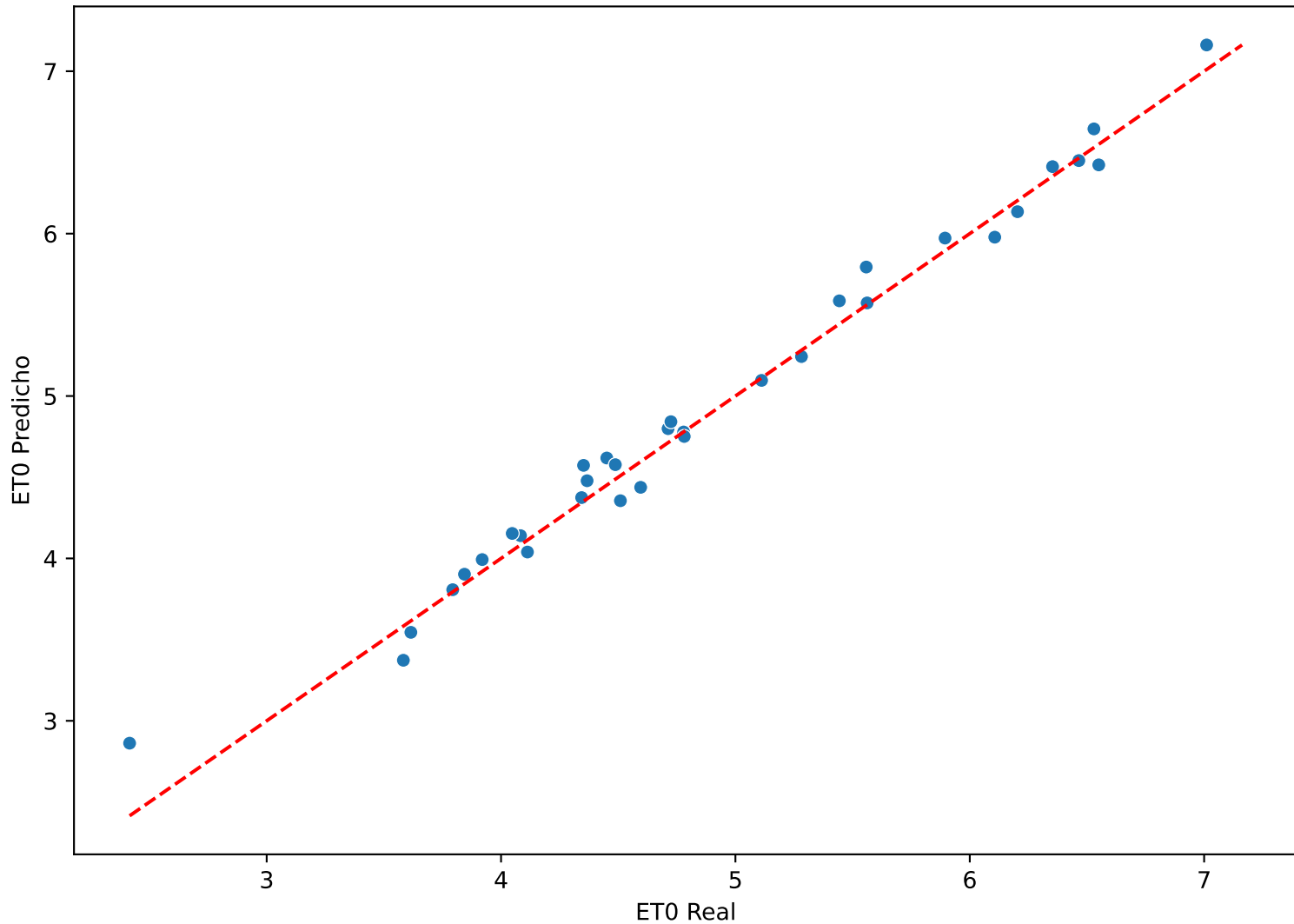
Ux vs ET0



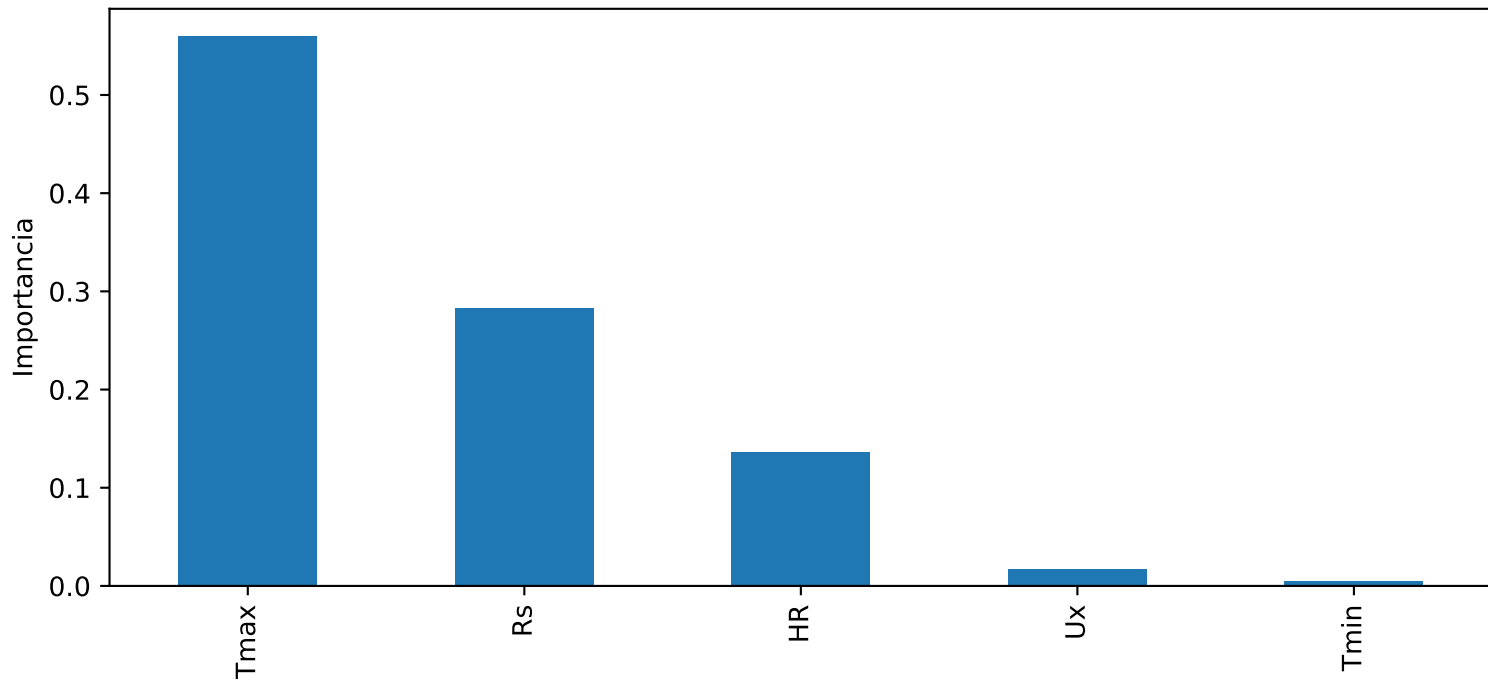
ET0 vs ETc



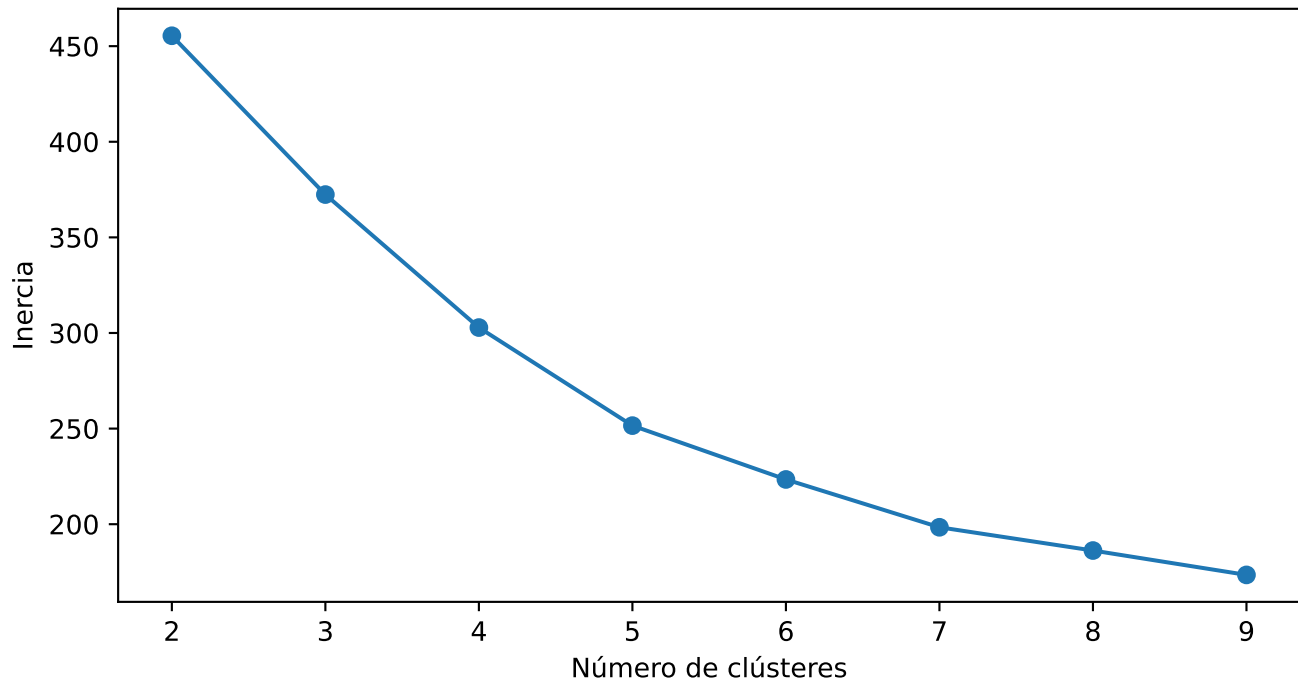
Comparación entre ET0 Real y Predicho — Zapopan (2019)



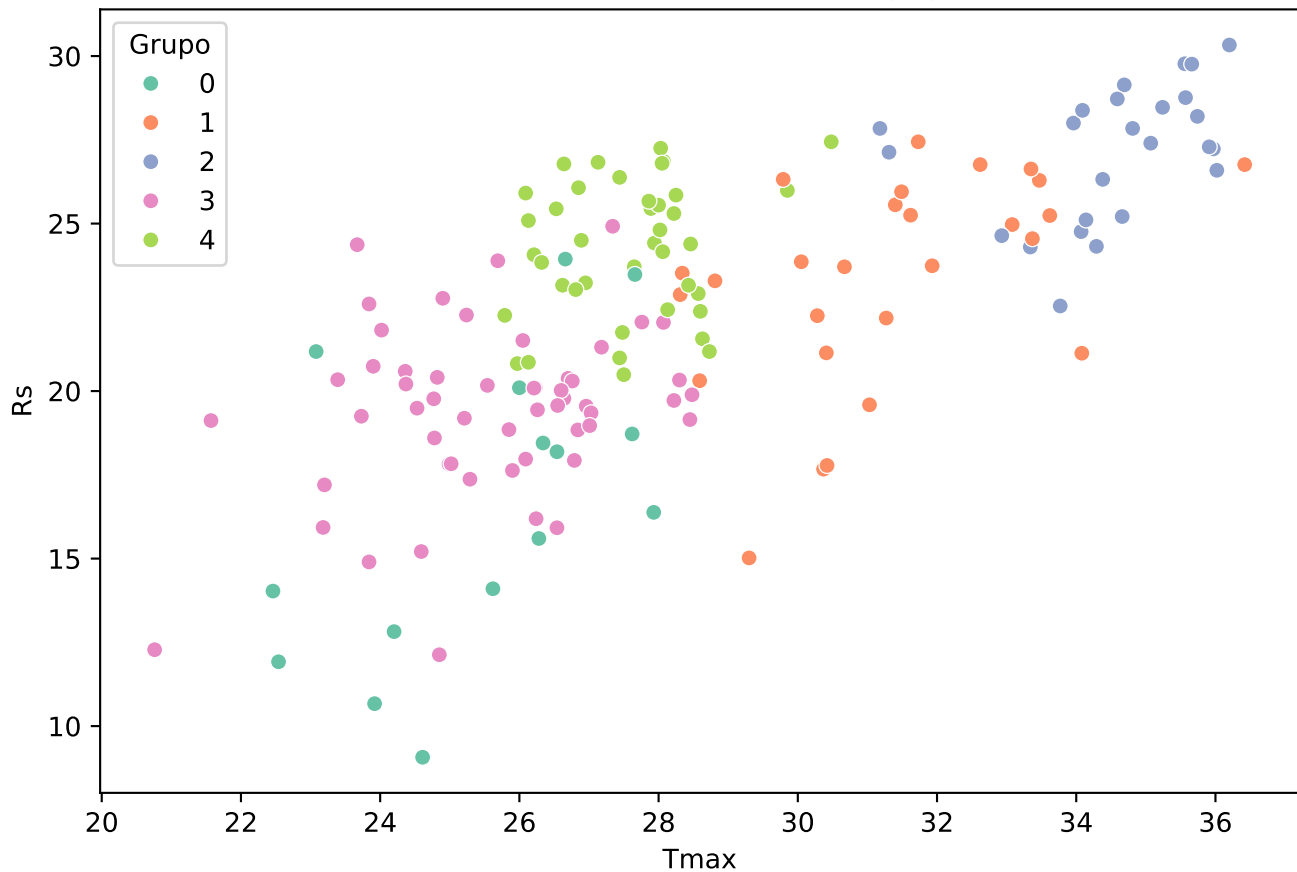
Importancia de variables (RF) — Zapopan (2019)



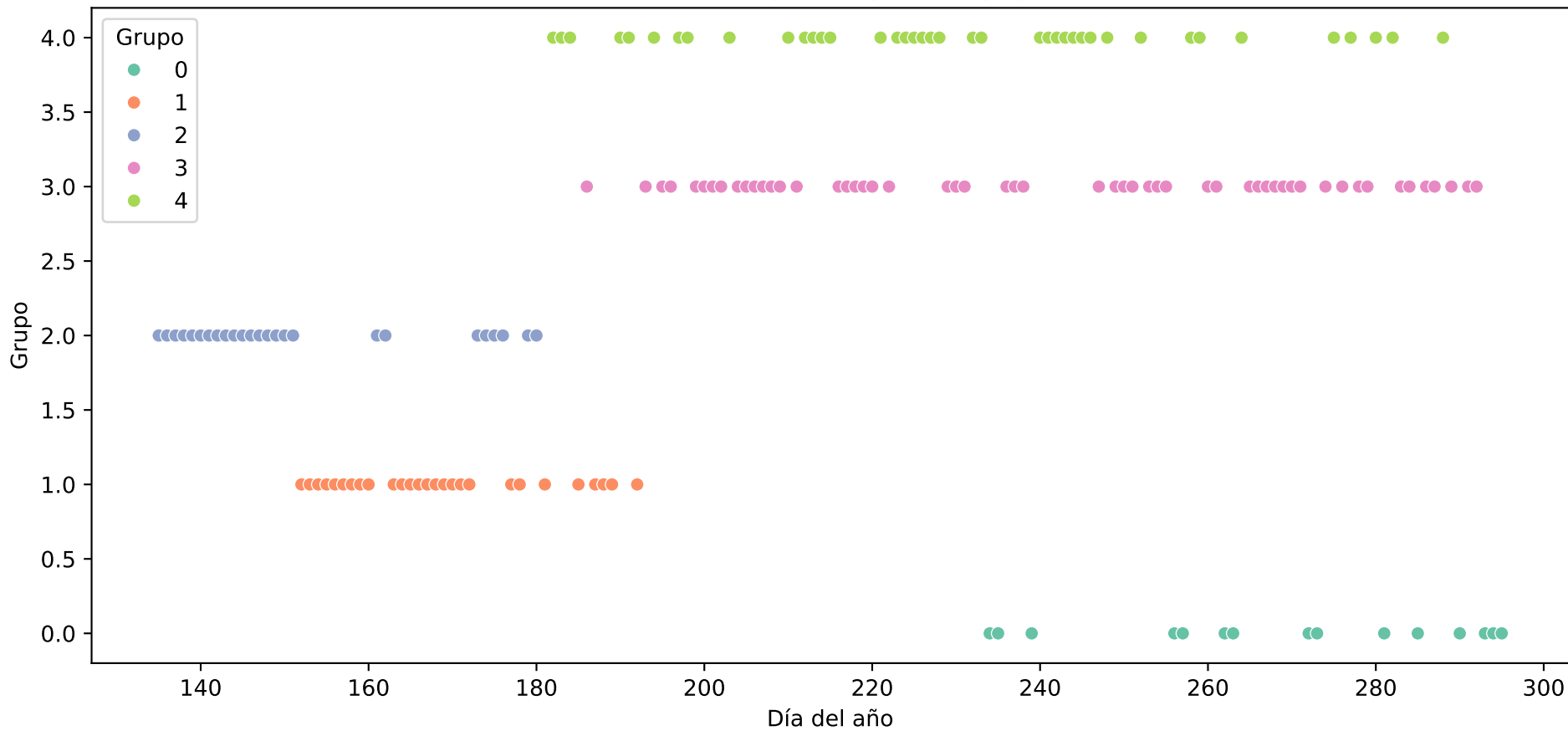
## Método del codo



Clasificación de días climáticos — Zapopan (2019)

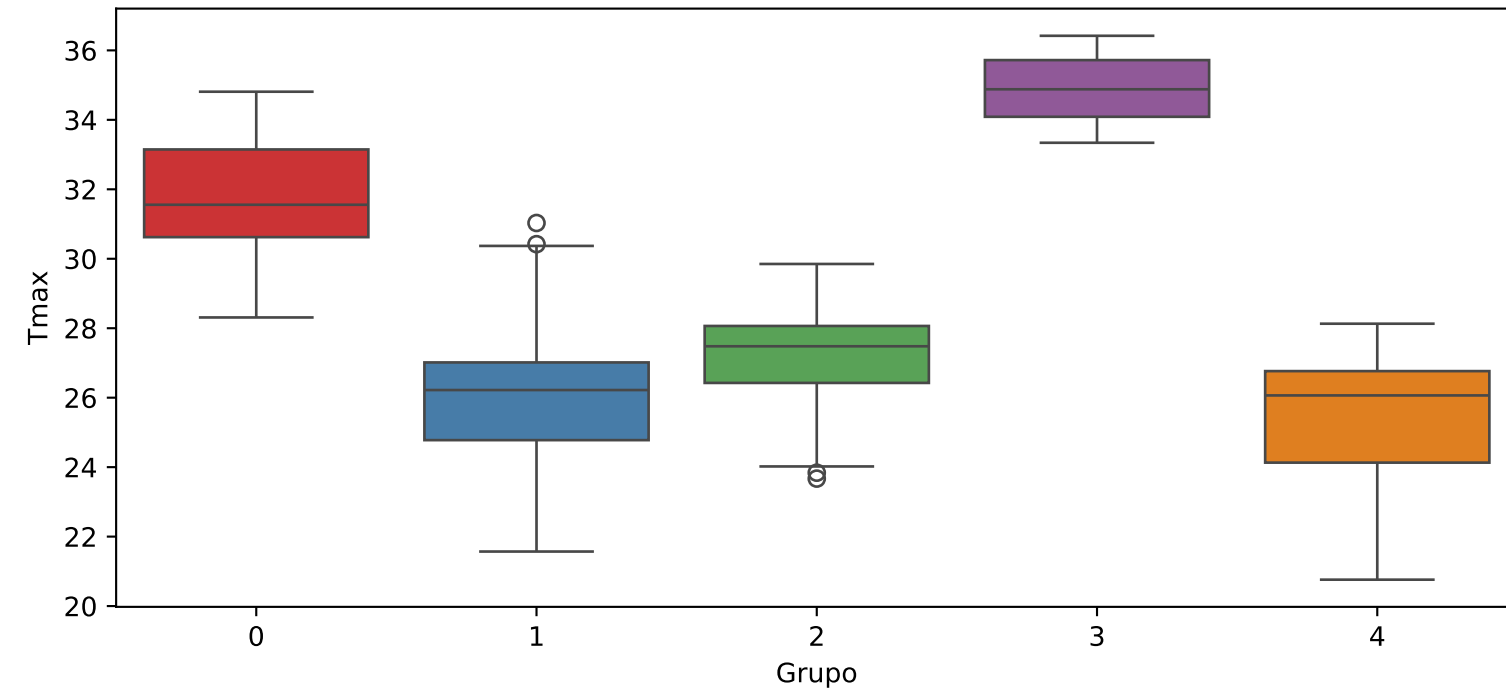


Distribución de días por grupo — Zapopan (2019)

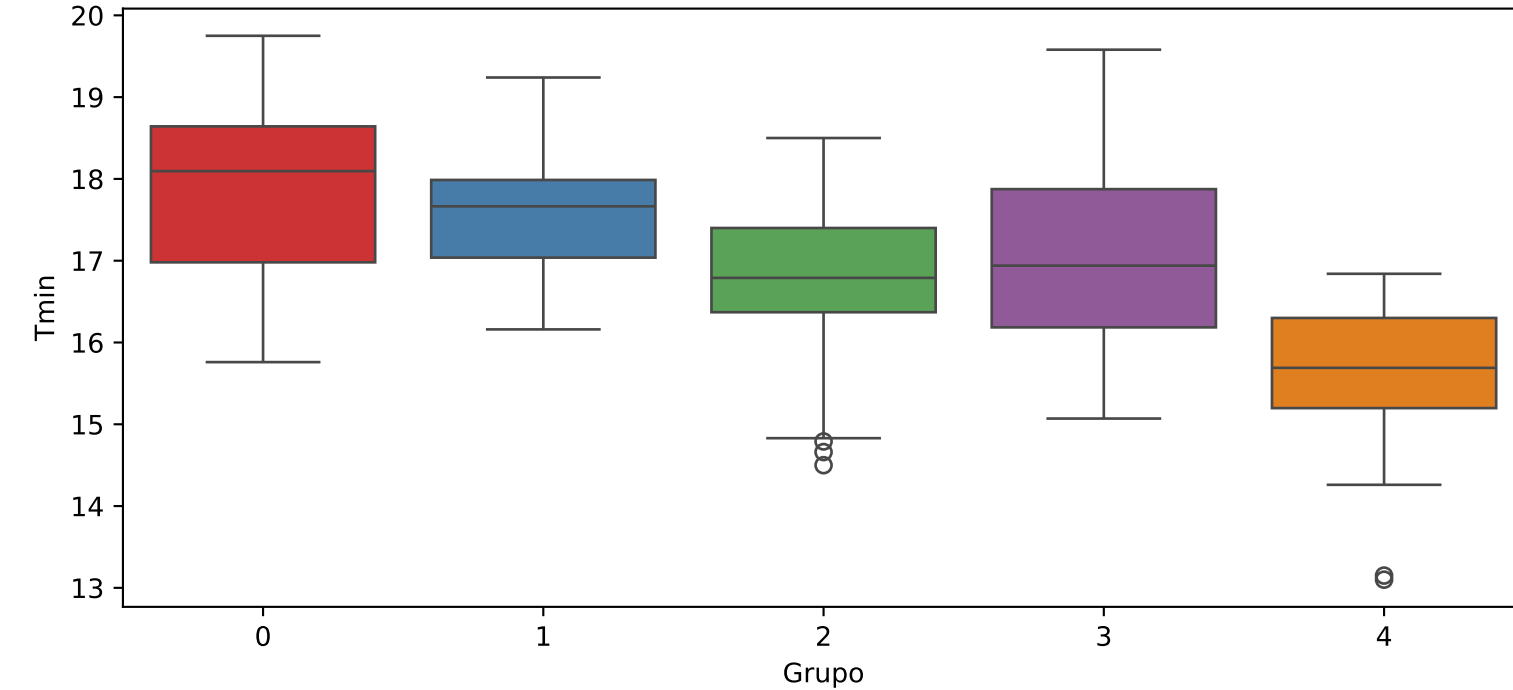


# Boxplots por grupo — Zapopan (2019)

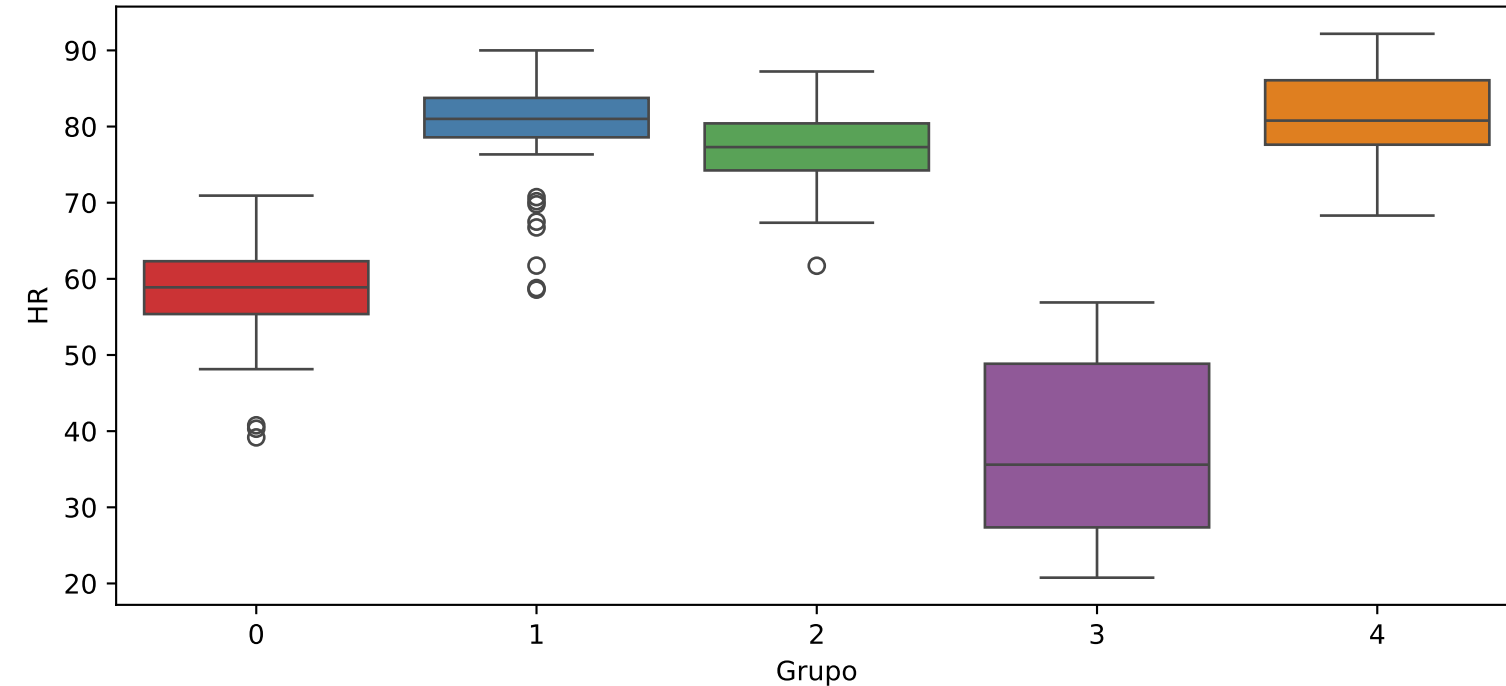
## Distribución de Tmax por grupo



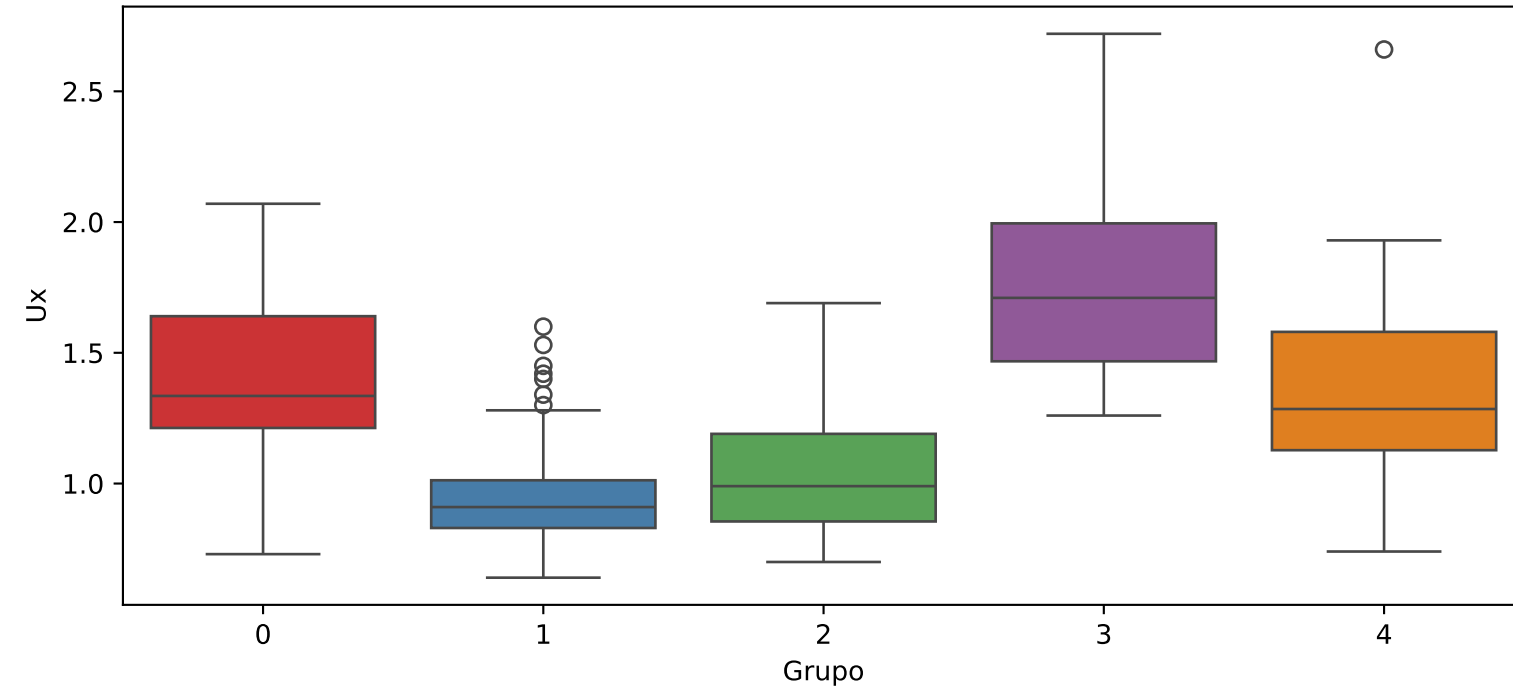
## Distribución de Tmin por grupo



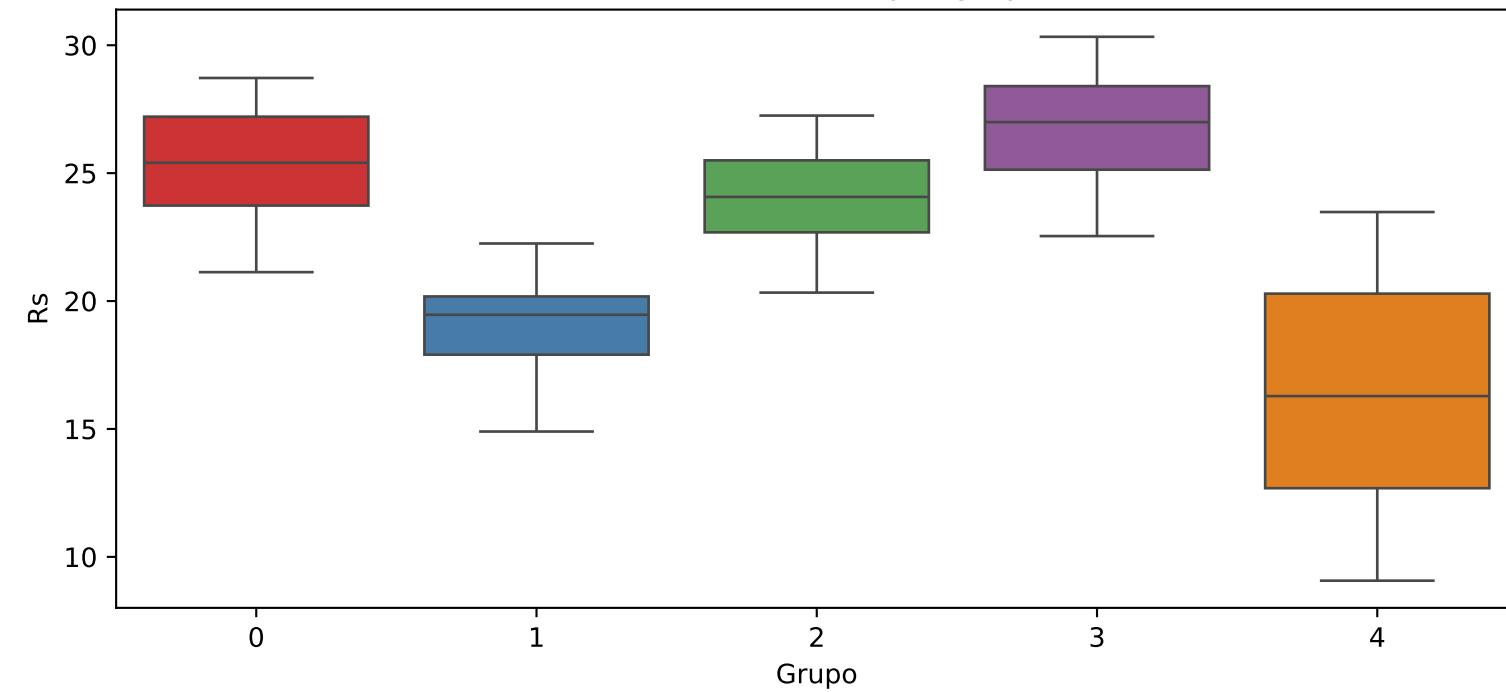
## Distribución de HR por grupo



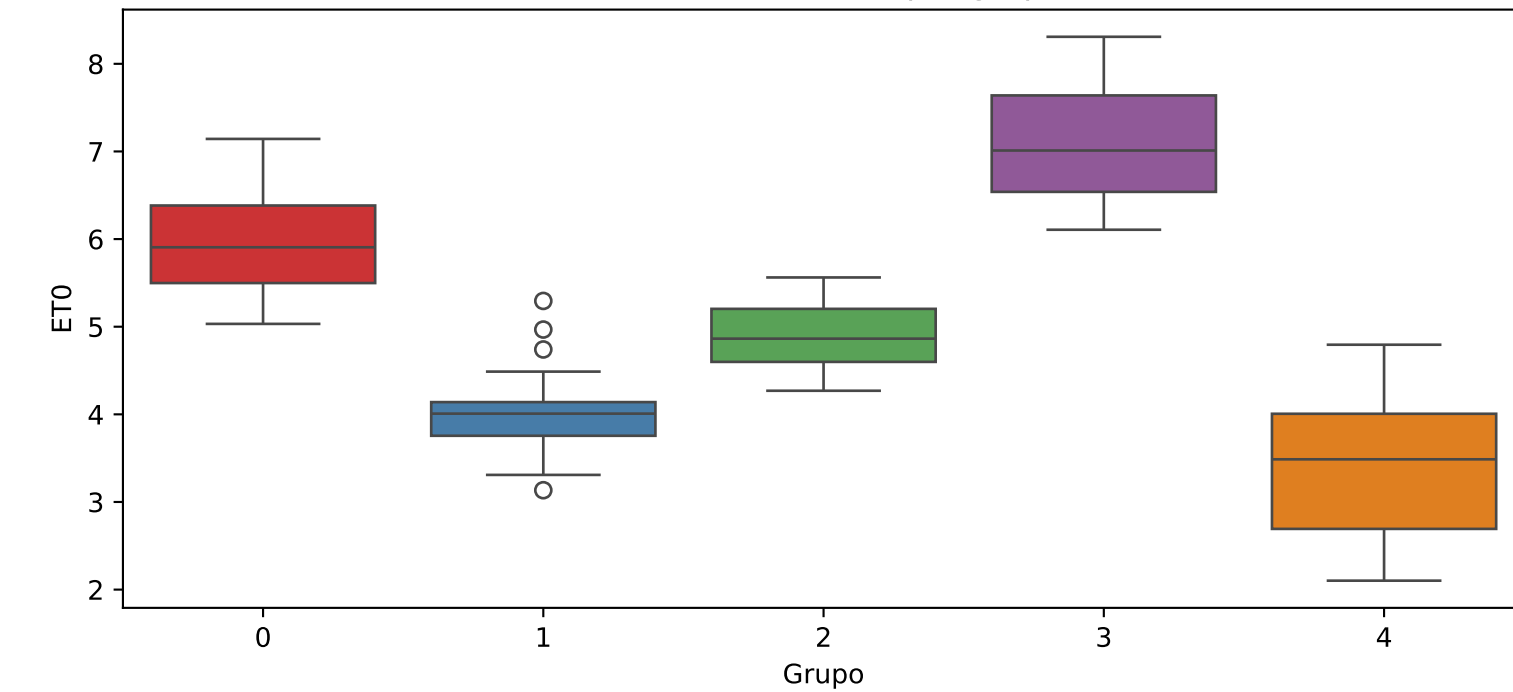
## Distribución de Ux por grupo



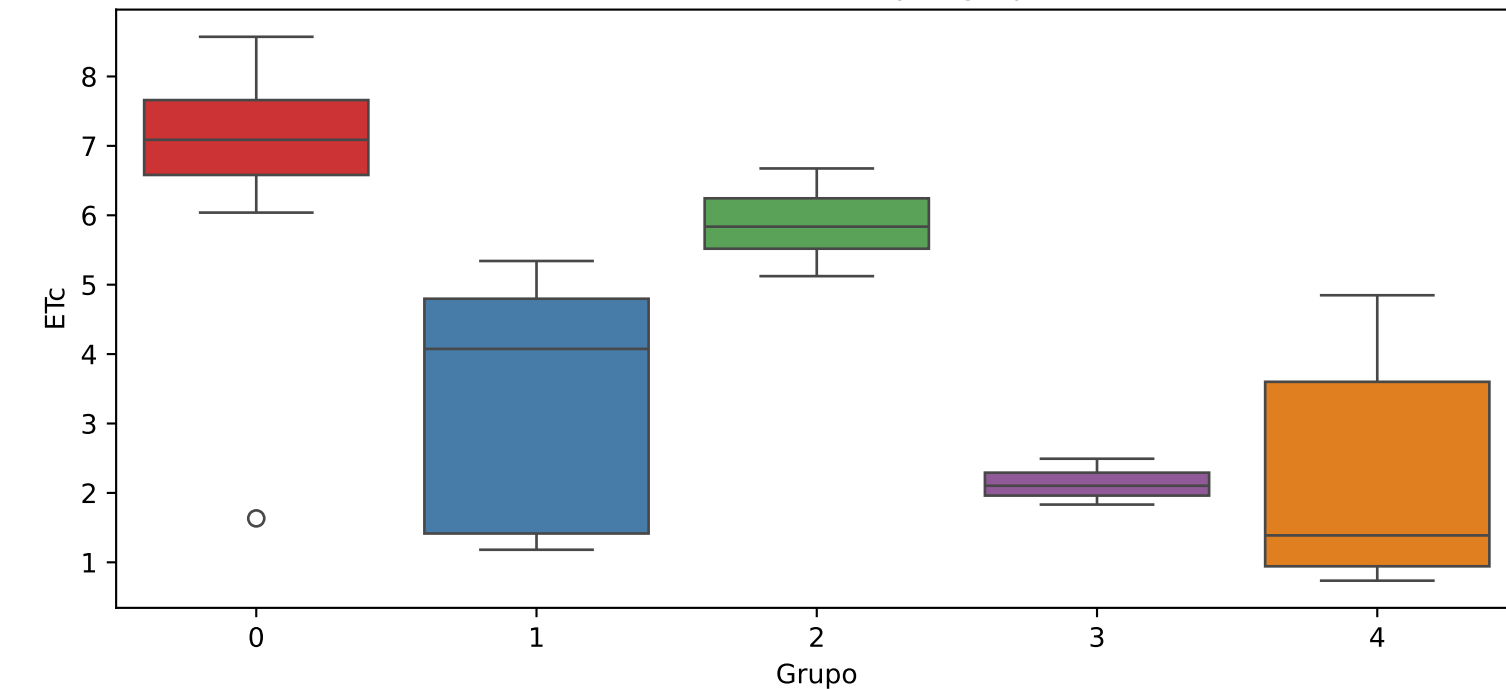
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

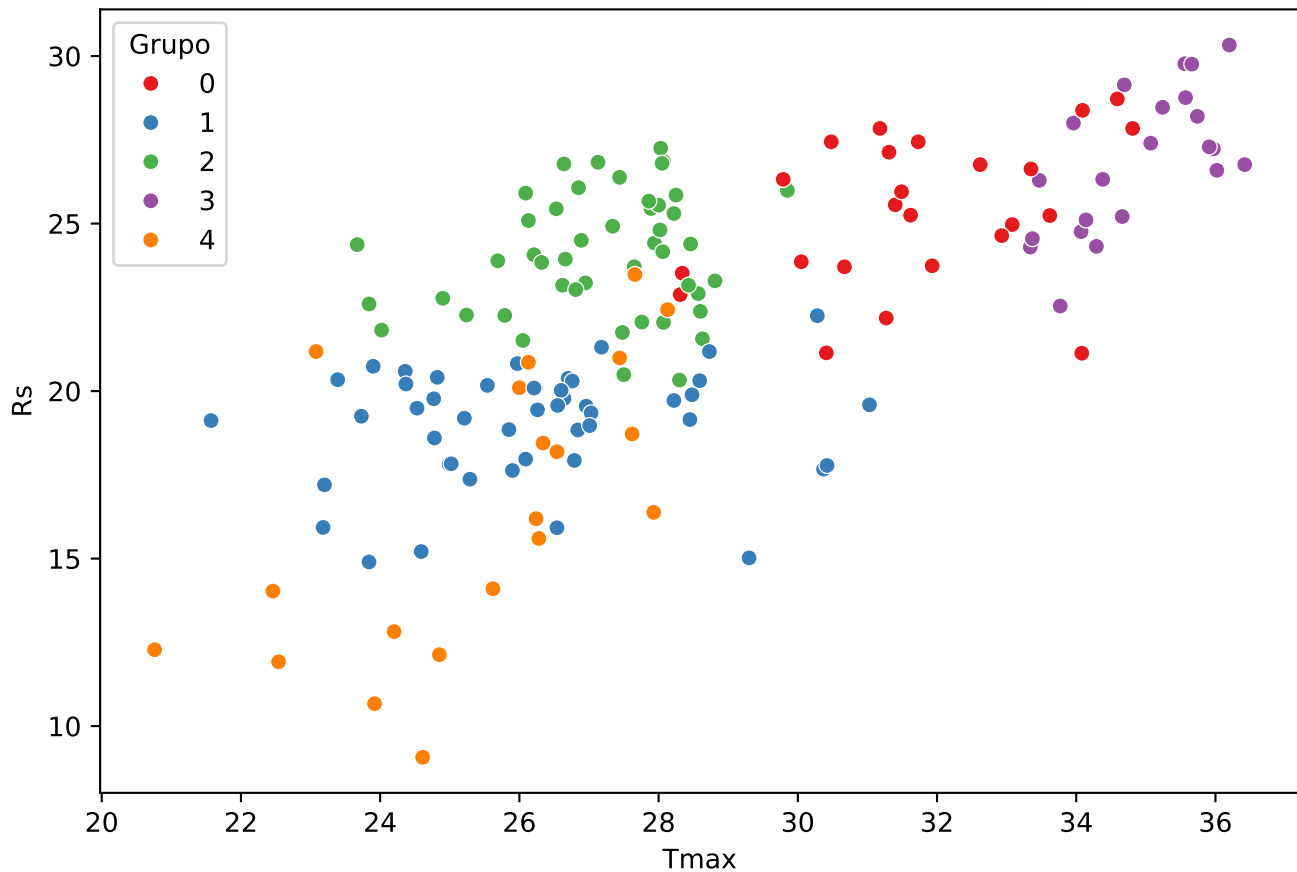


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2019)



## **Zapopan — 2020**

Días del ciclo: 161

ETc total [mm]: 673.2

ETverde total [mm]: 311.5

ETazul total [mm]: 361.7

Tmax / Tmin [°C]: 37.6 / 7.2

## Zapopan — 2020 · Resultados y métricas

[Zapopan 2020] Regresión Lineal ET0 —  $R^2$ : 0.9897 MSE: 0.0185

[Zapopan 2020] Random Forest ET0 —  $R^2$ : 0.9567 MSE: 0.0780

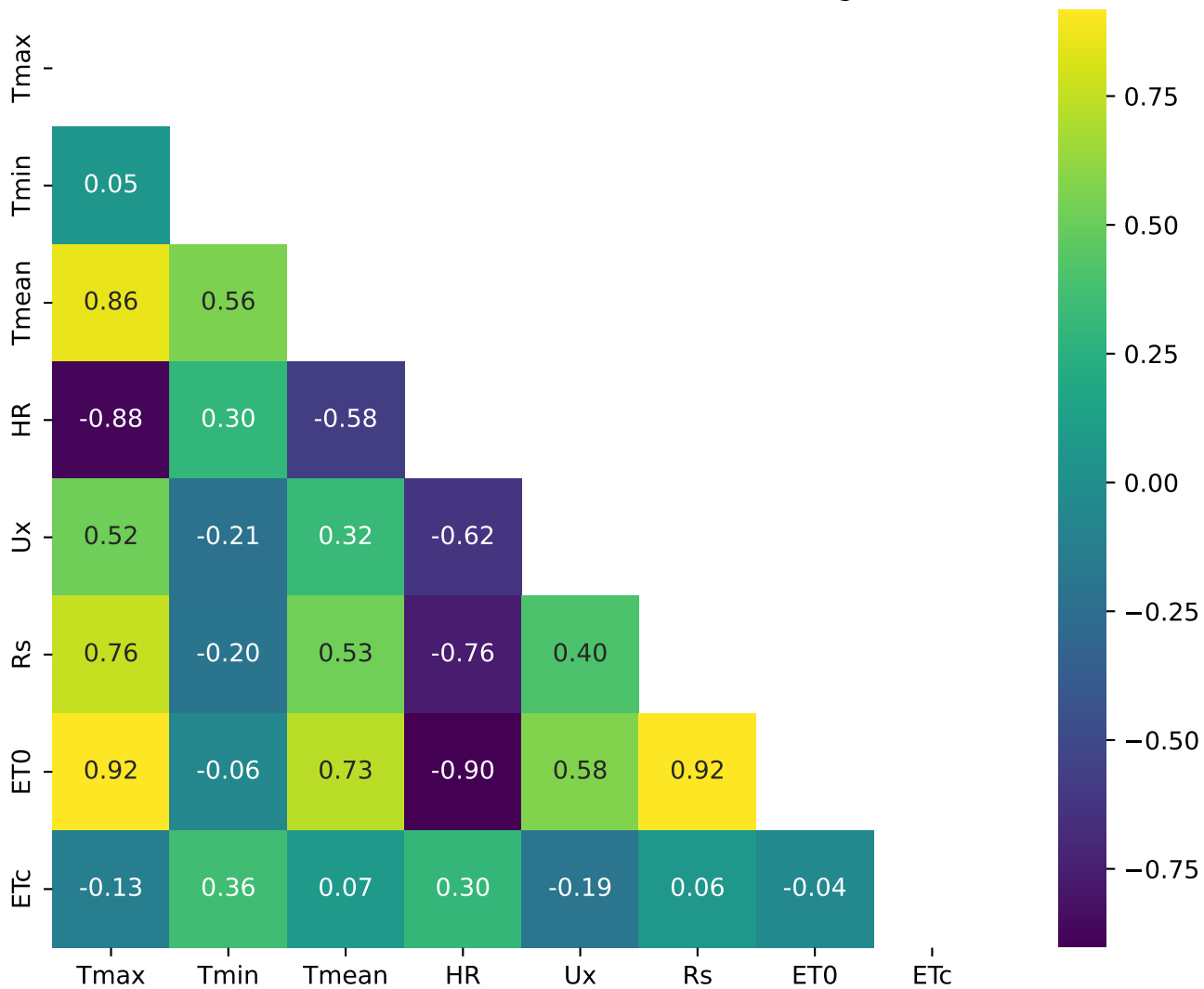
Importancias: {'Tmax': 0.7078070521239086, 'Tmin': 0.00452159421291493, 'HR': 0.028644444525198976, 'Ux': 0.004843989883716524, 'Rs': 0.2541829192542609}

Estadísticas descriptivas por grupo (medias):

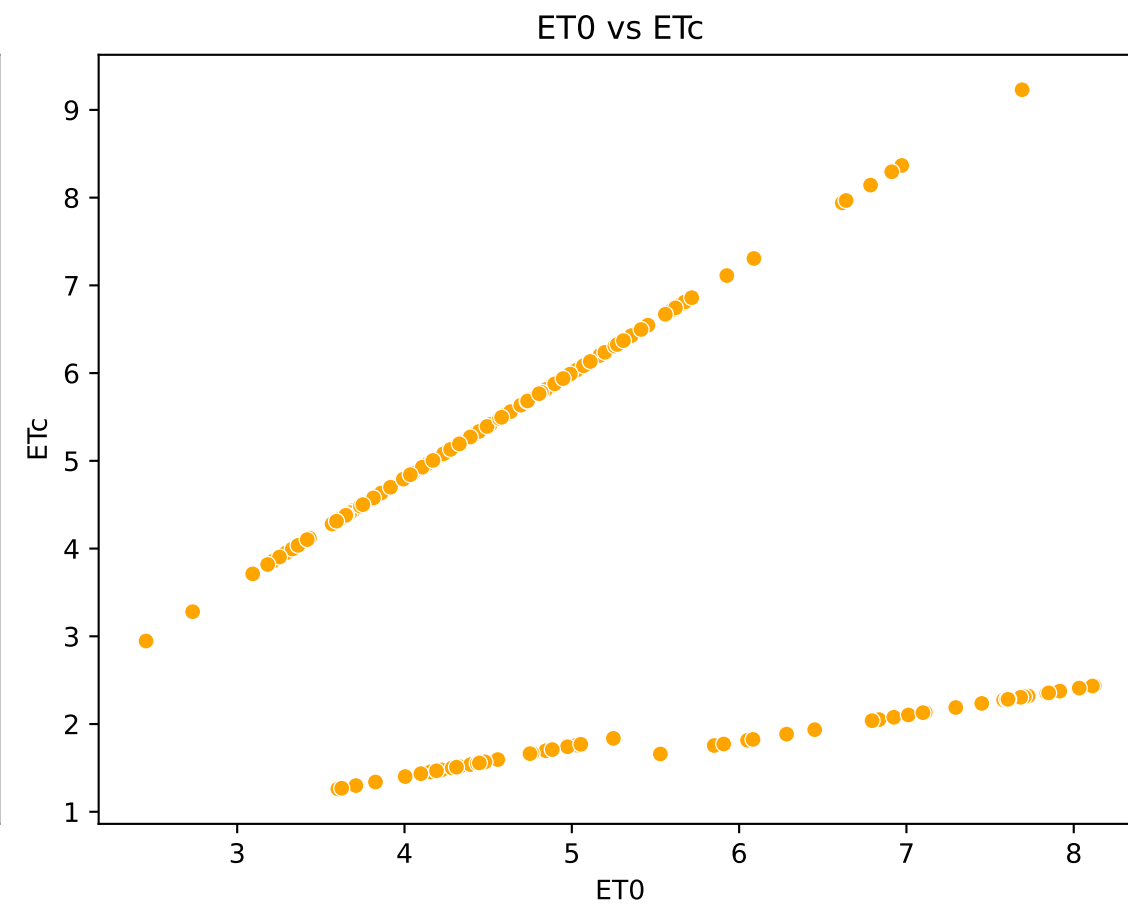
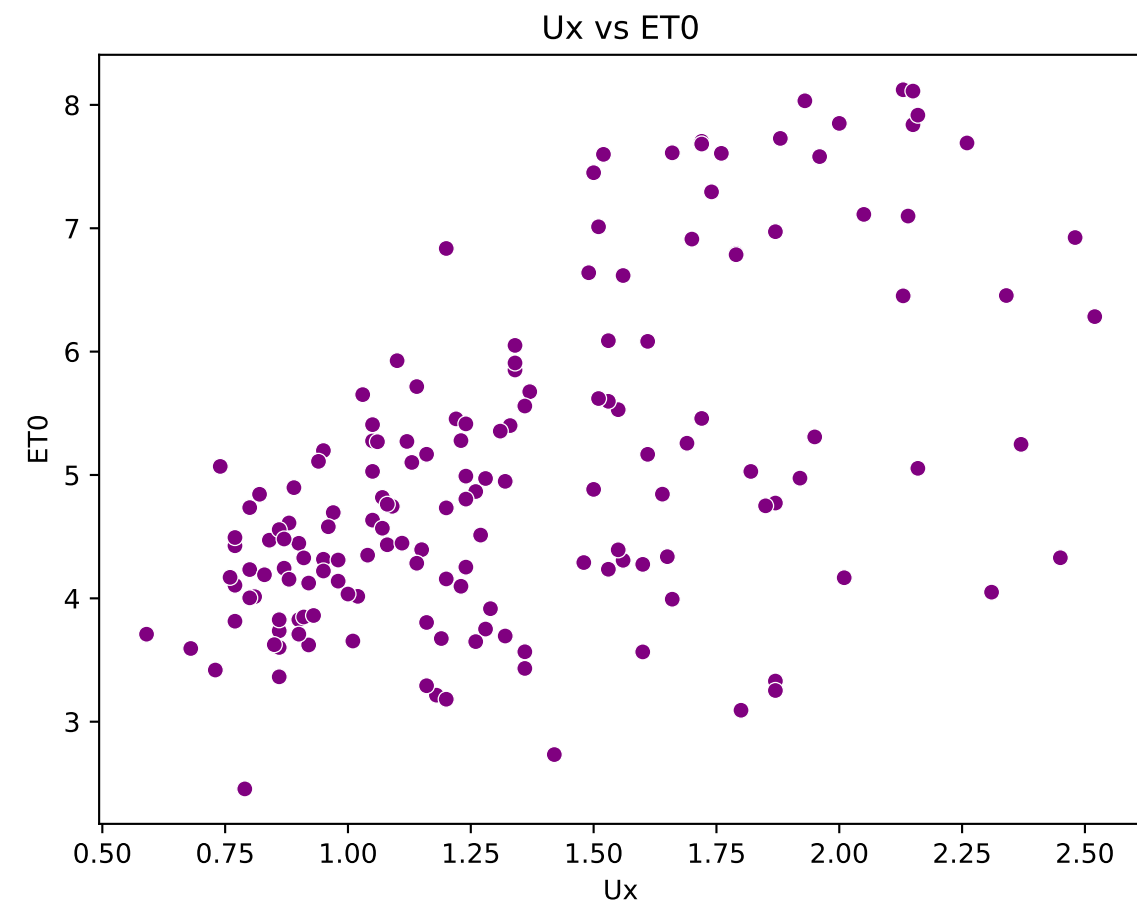
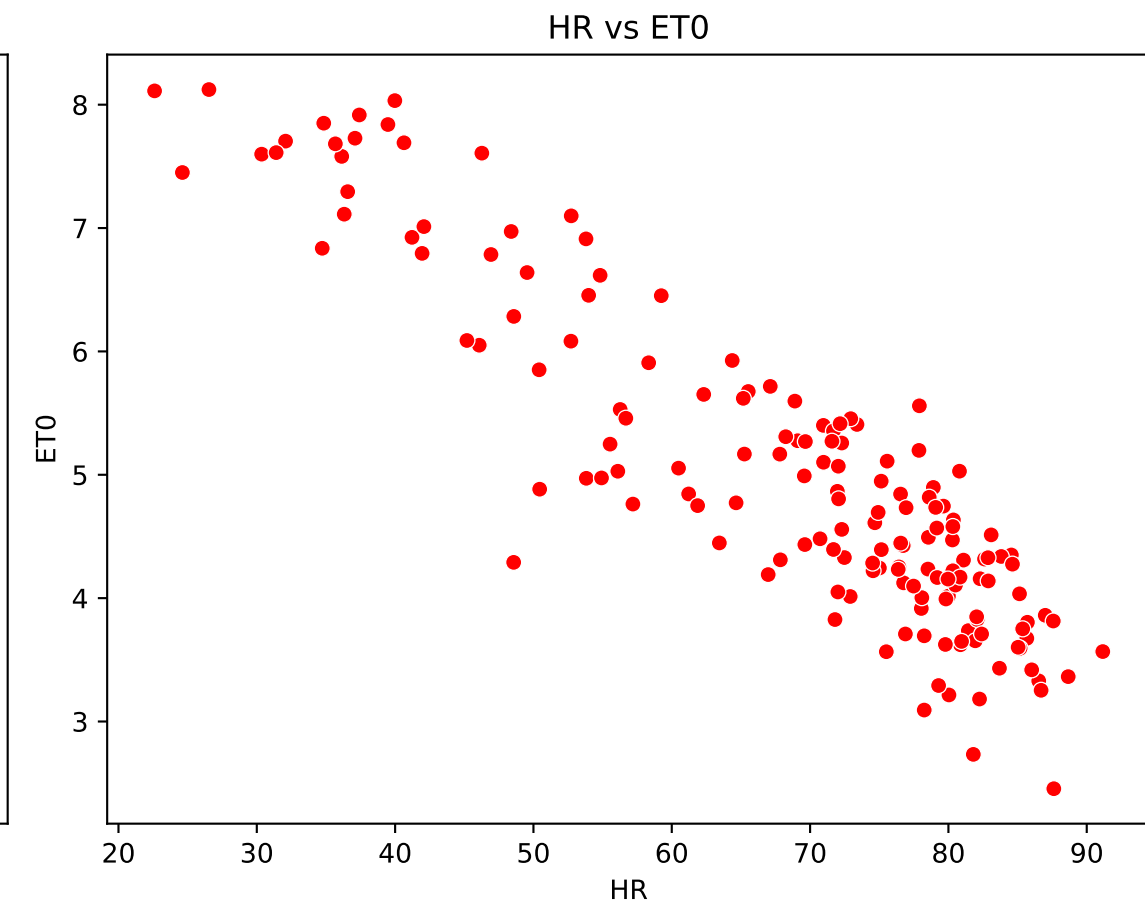
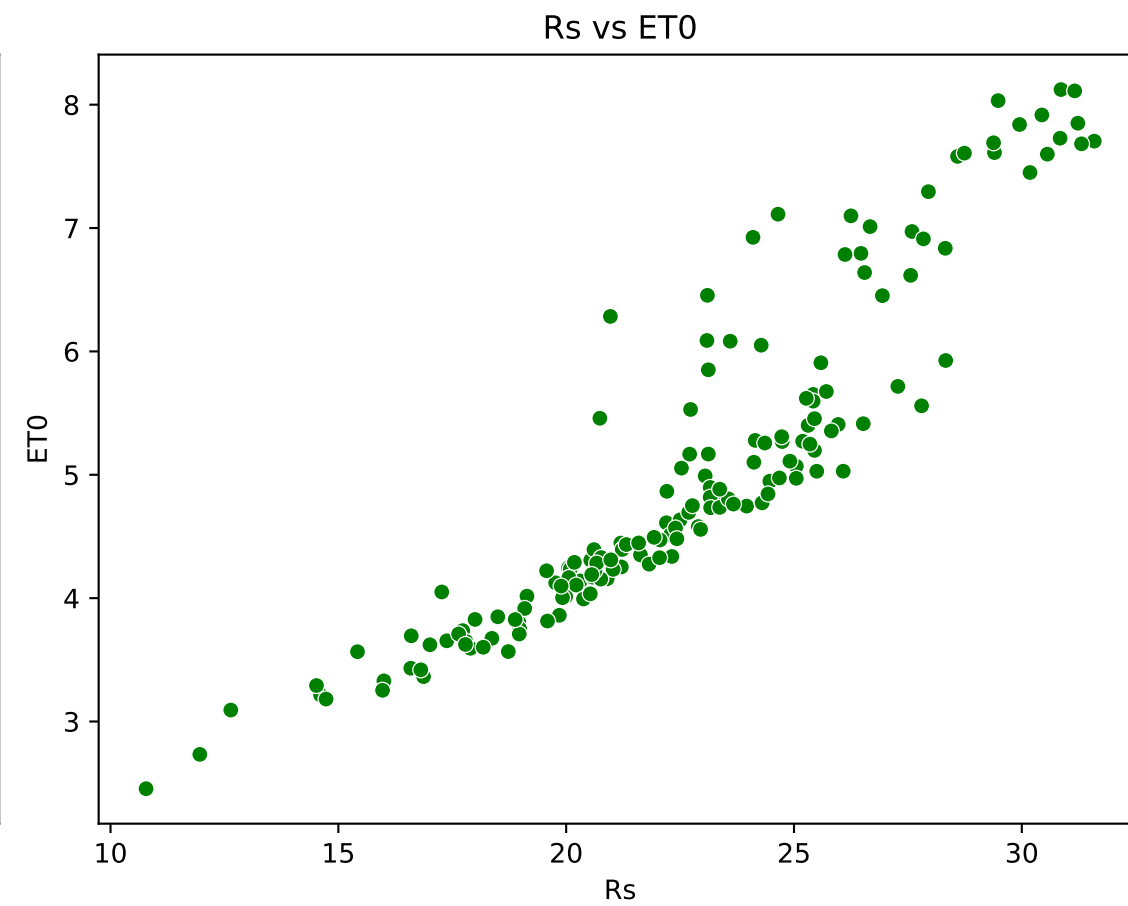
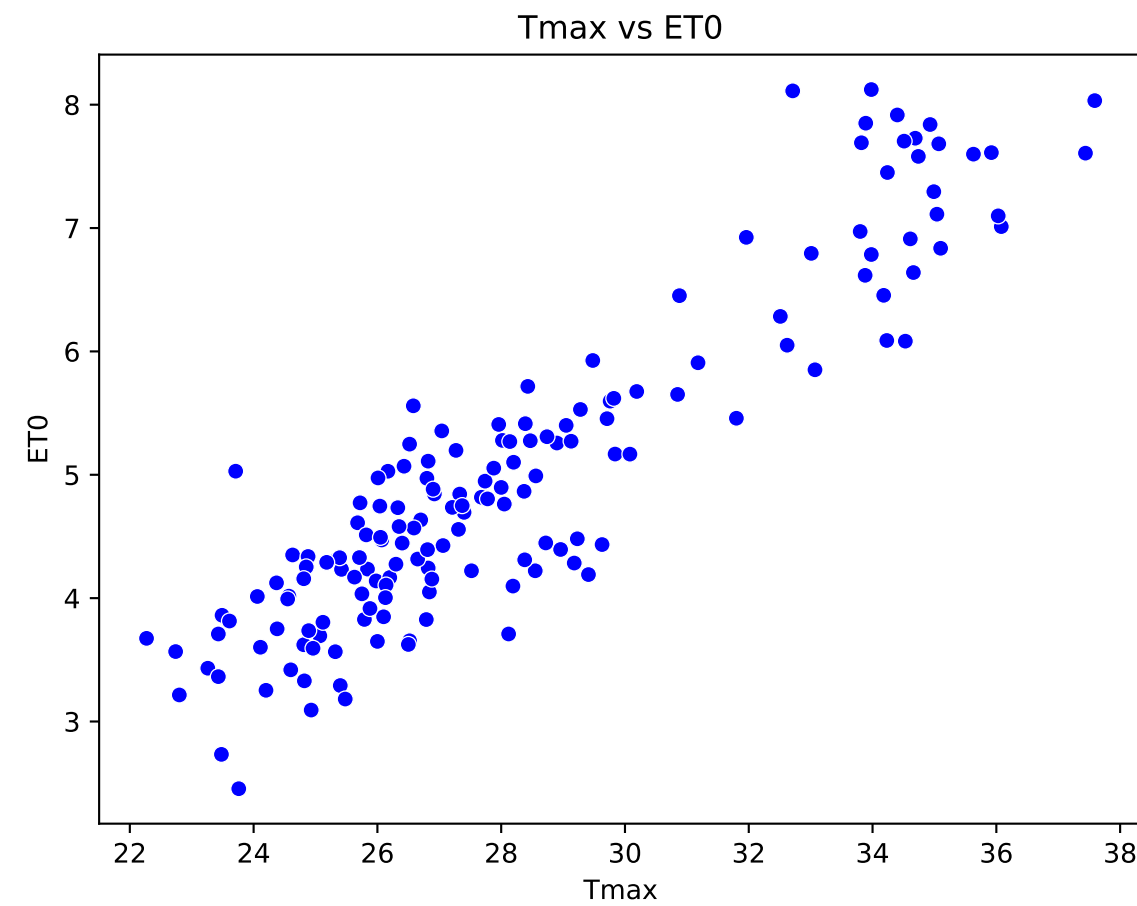
	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.602500	10.674167	58.108333	1.785000	23.550000	4.825713	1.689000
1	25.687344	16.694375	79.731562	1.107969	18.782344	3.872833	3.717041
2	34.144828	16.463448	40.886552	1.838621	27.554138	7.121481	2.136444
3	33.847500	17.778750	49.498750	1.740000	26.108750	6.645527	7.974632
4	27.670000	16.864375	73.947292	1.168333	24.026042	5.023169	6.027803

**Zapopan — 2020**

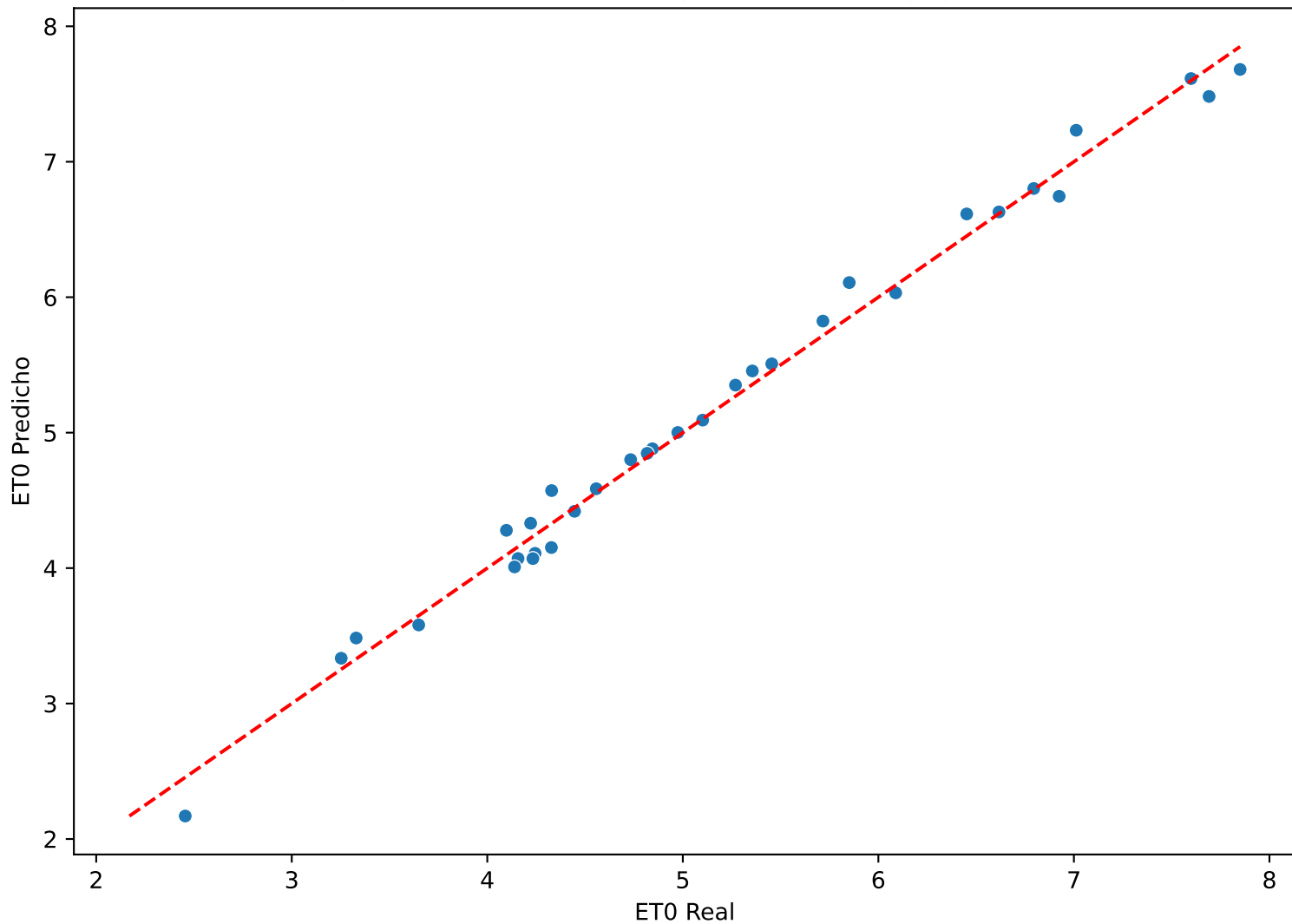
Matriz de Correlación entre Variables Meteorológicas



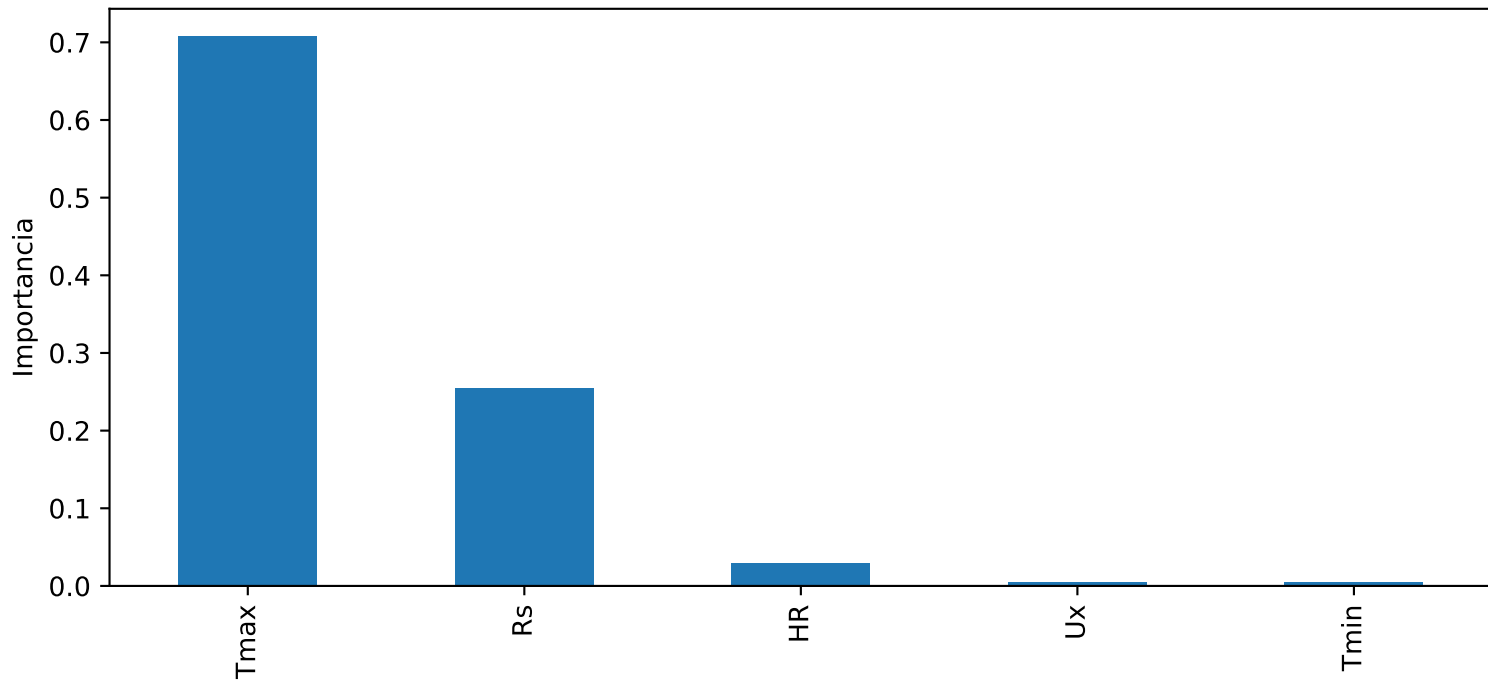
Dispersión — Zapopan (2020)



Comparación entre ET0 Real y Predicho — Zapopan (2020)

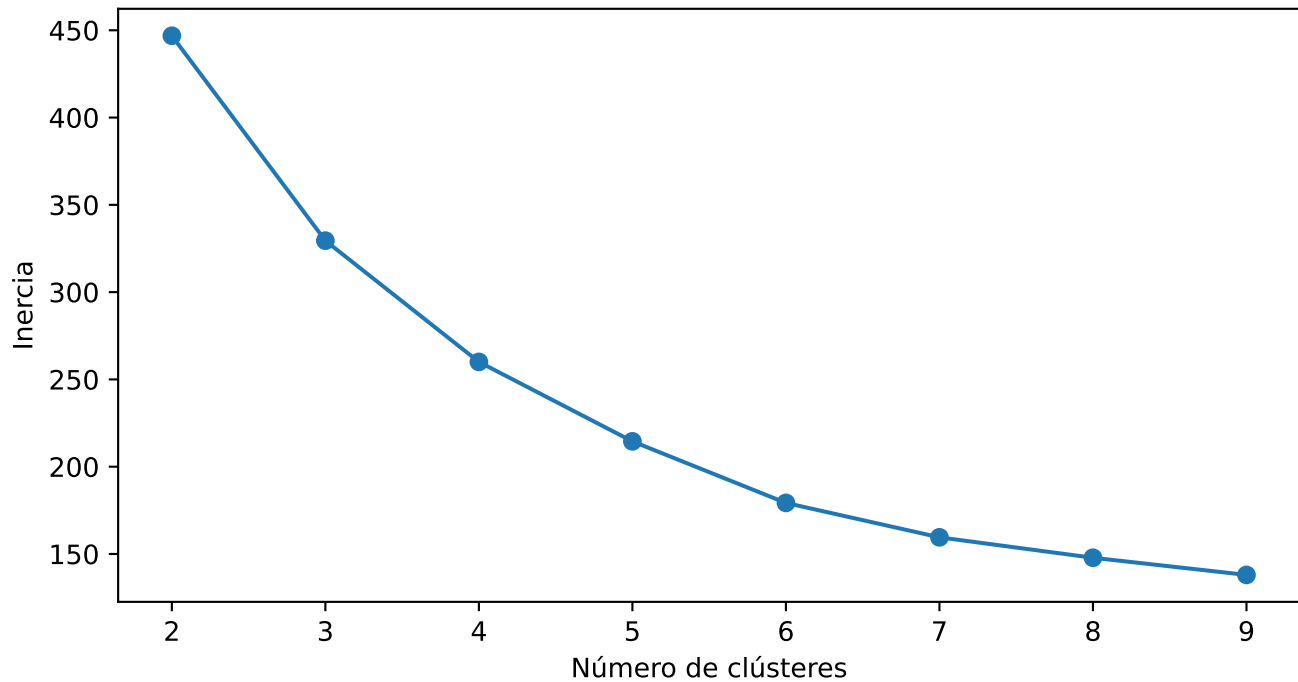


Importancia de variables (RF) — Zapopan (2020)

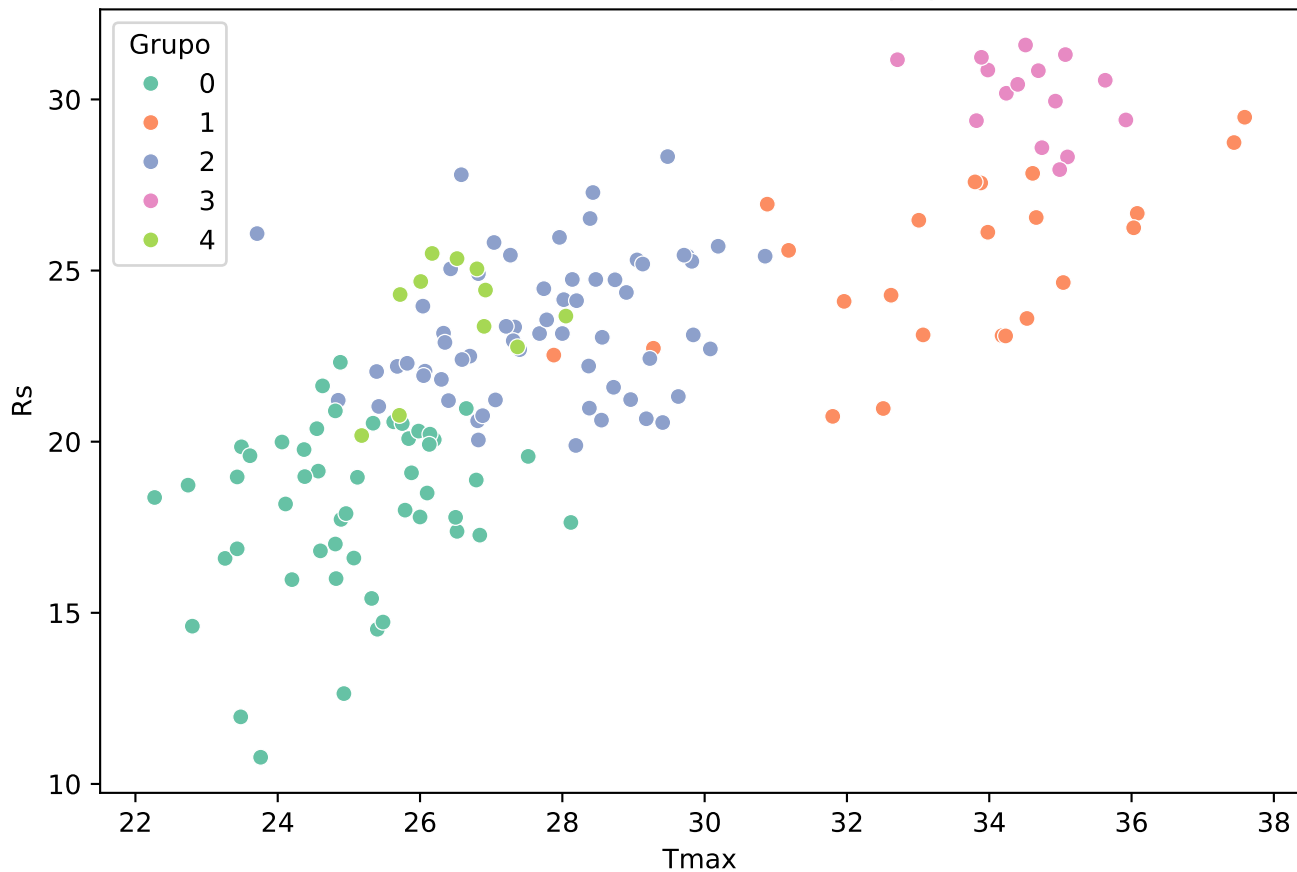




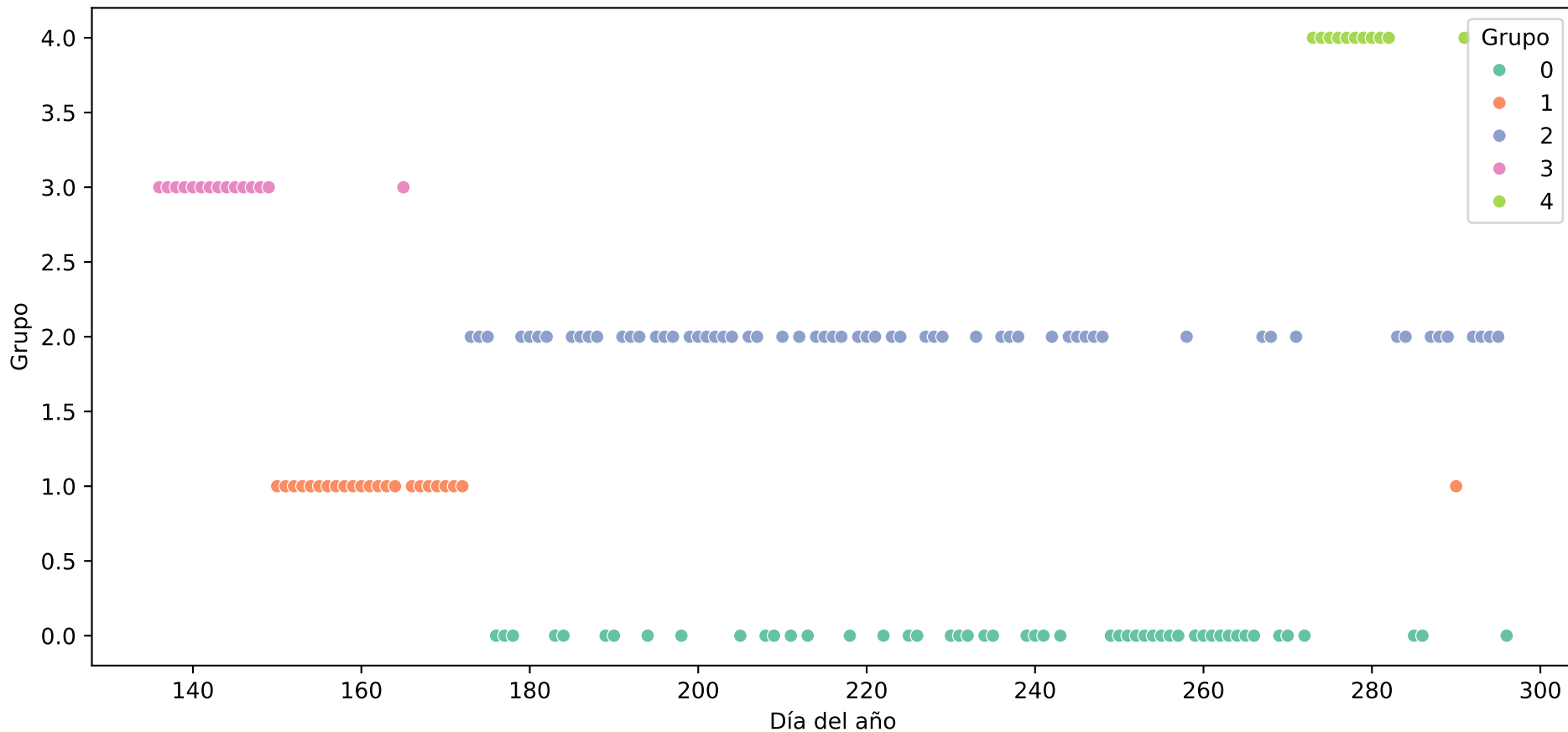
## Método del codo



Clasificación de días climáticos — Zapopan (2020)

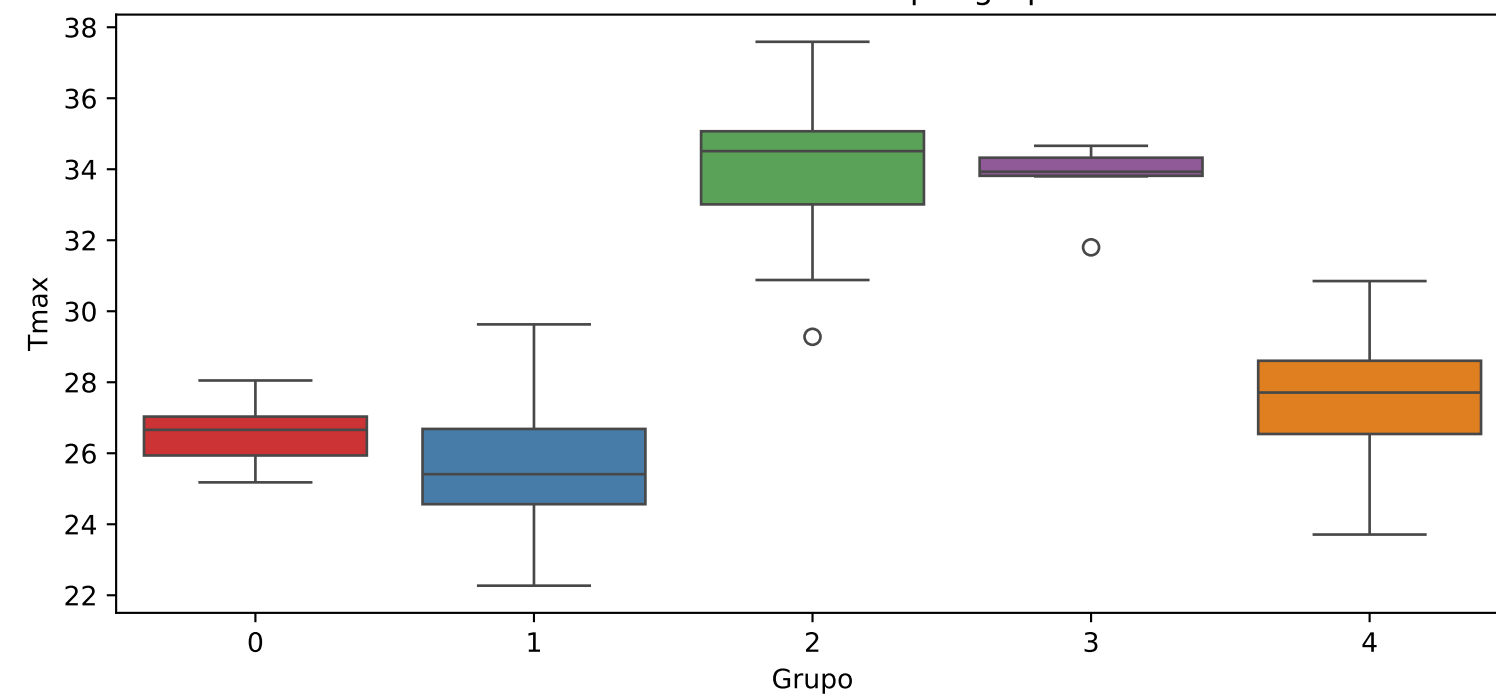


Distribución de días por grupo — Zapopan (2020)

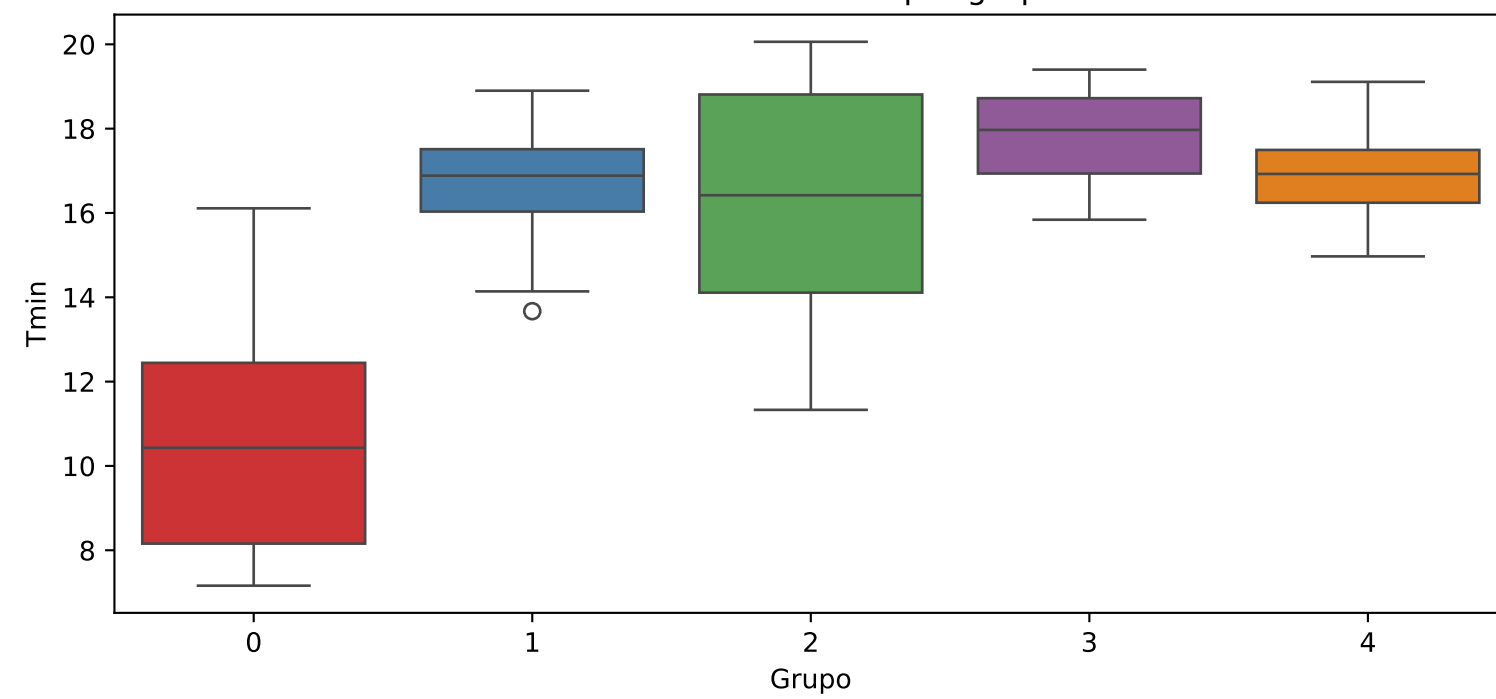


# Boxplots por grupo — Zapopan (2020)

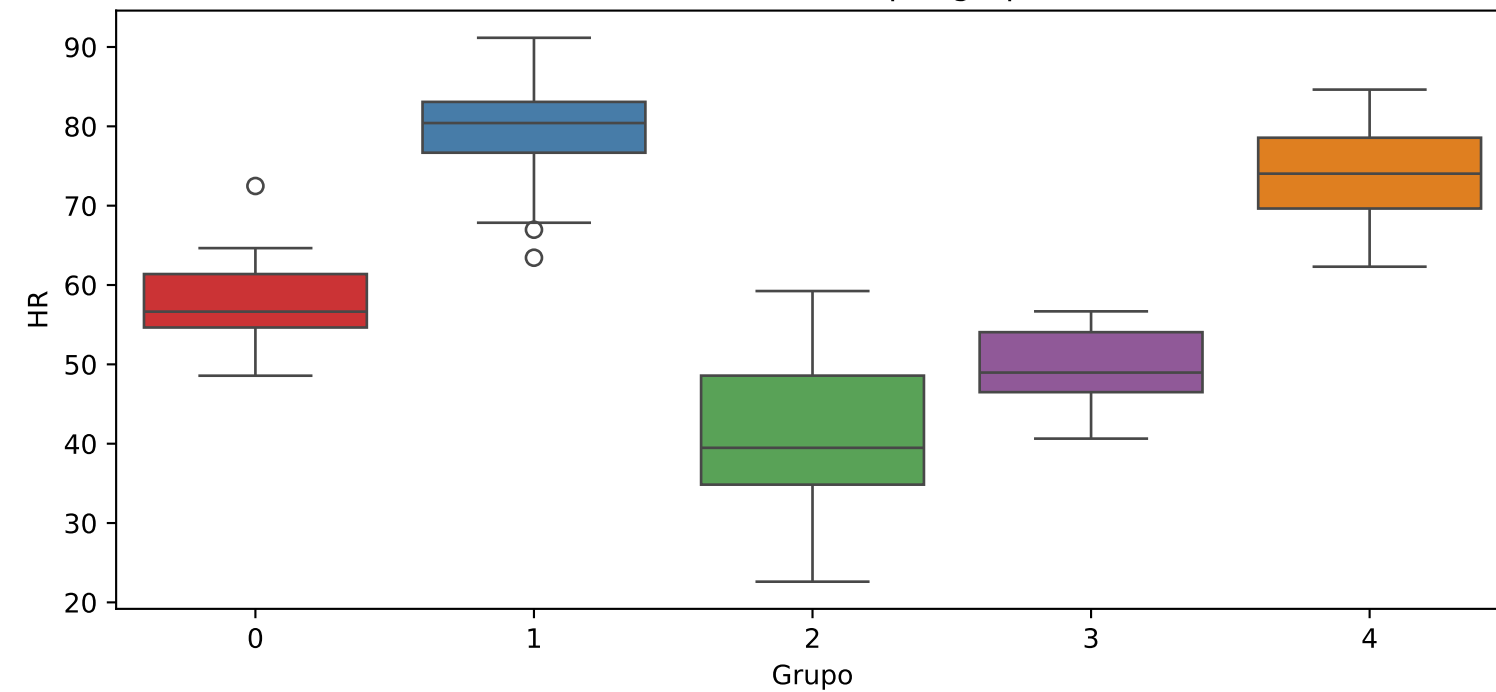
## Distribución de Tmax por grupo



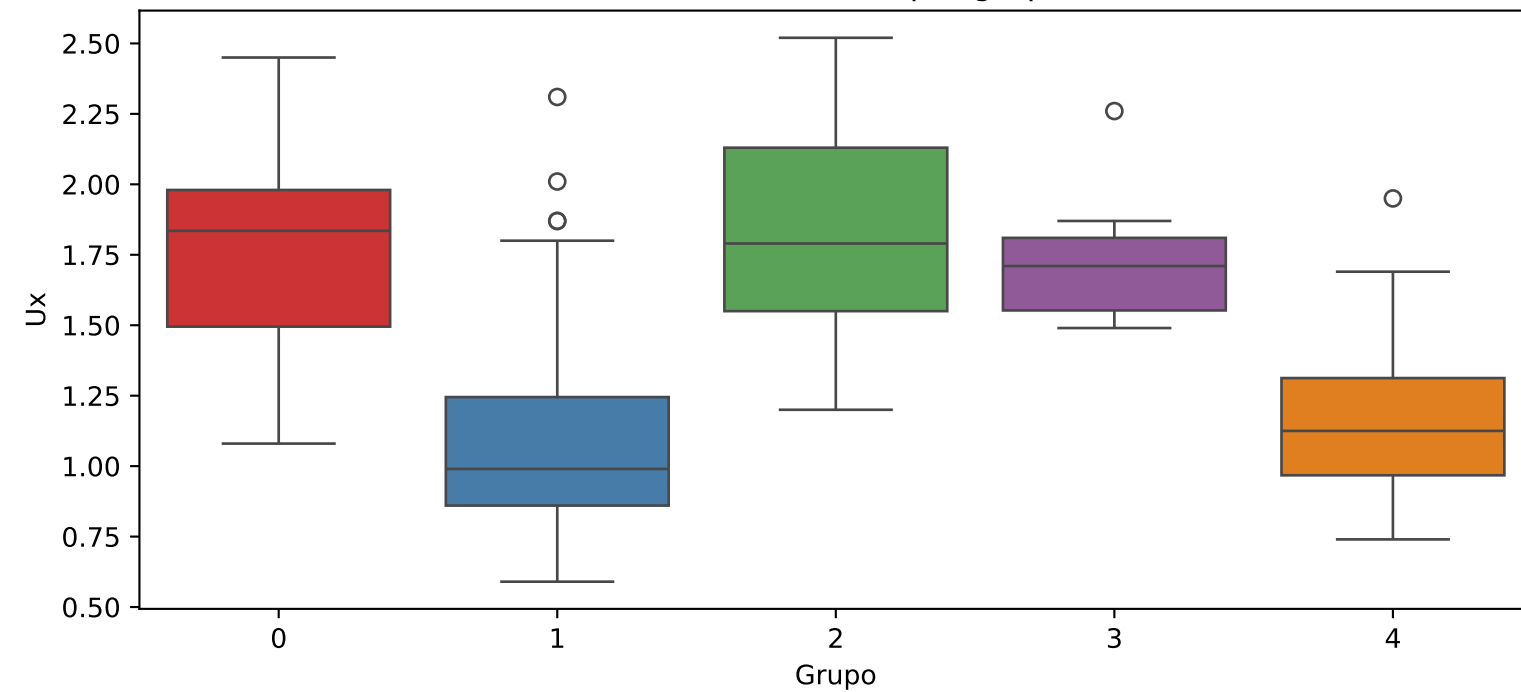
## Distribución de Tmin por grupo



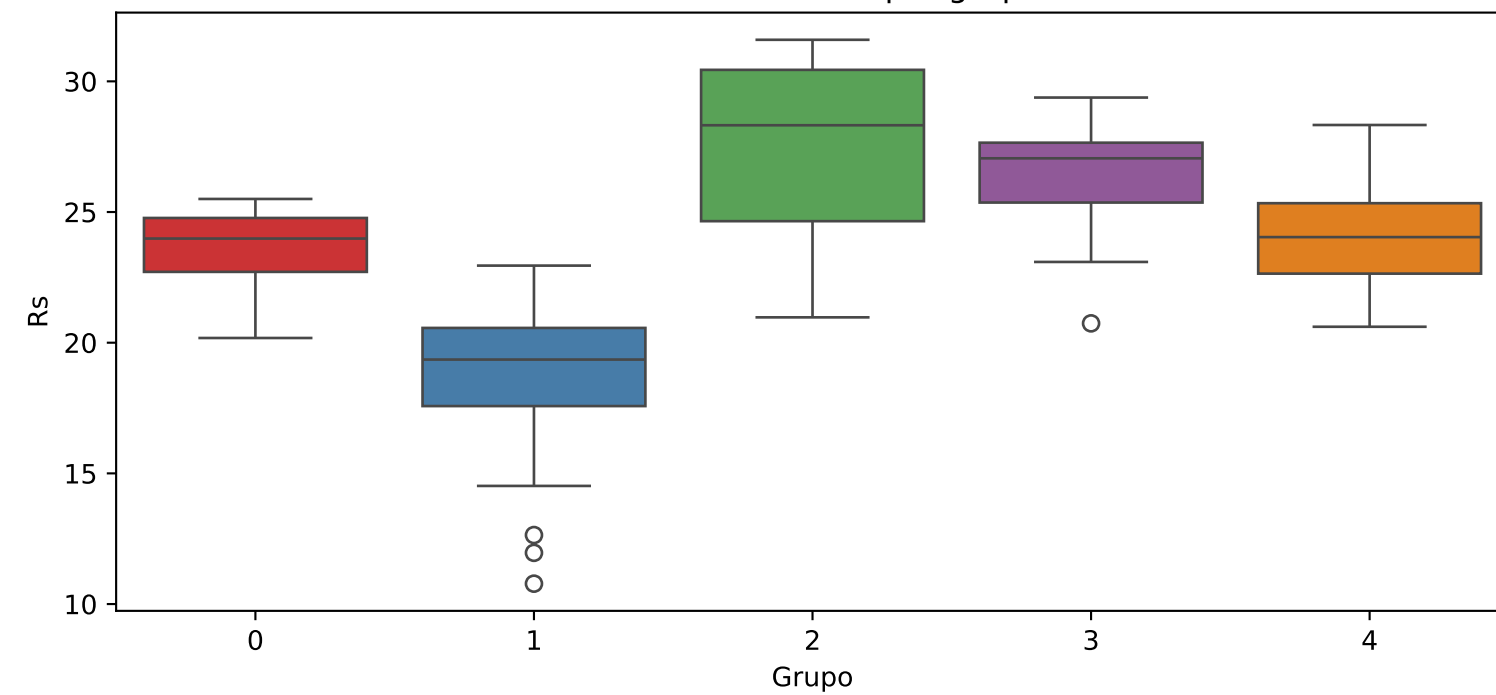
## Distribución de HR por grupo



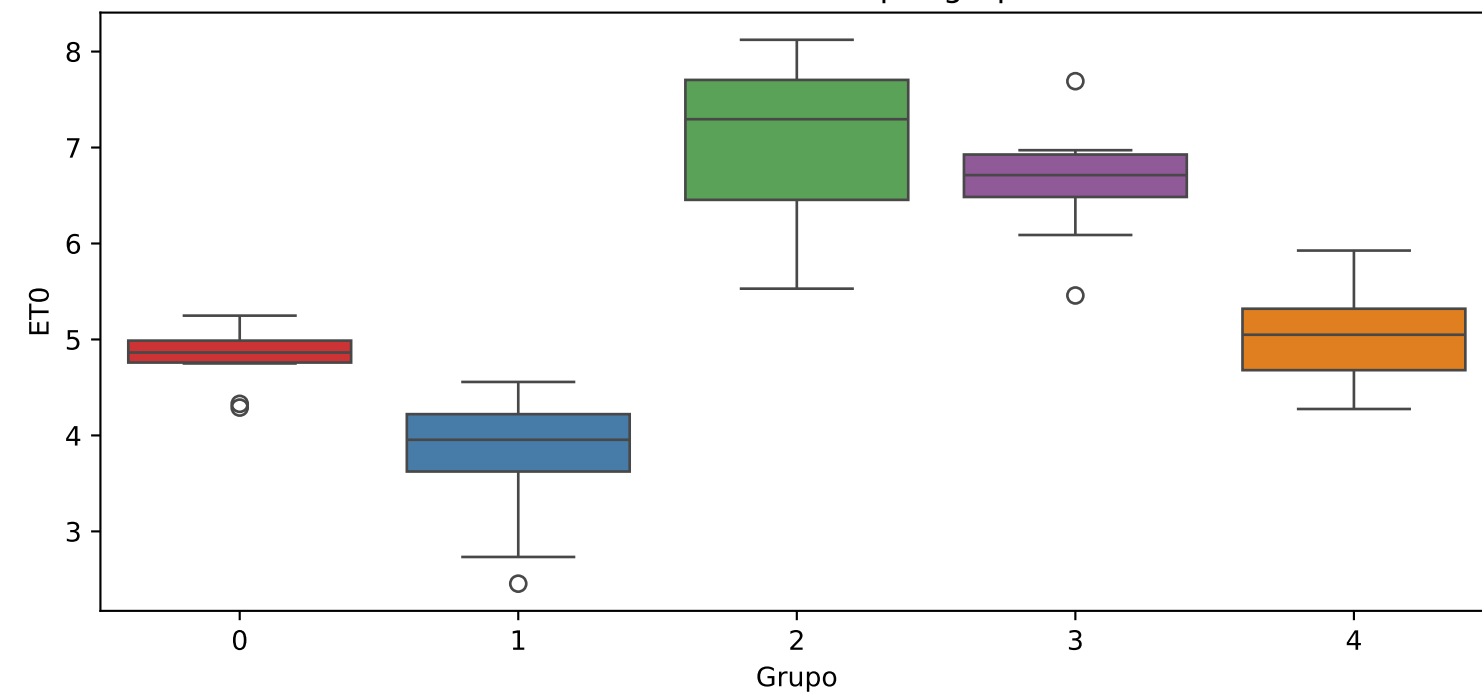
## Distribución de Ux por grupo



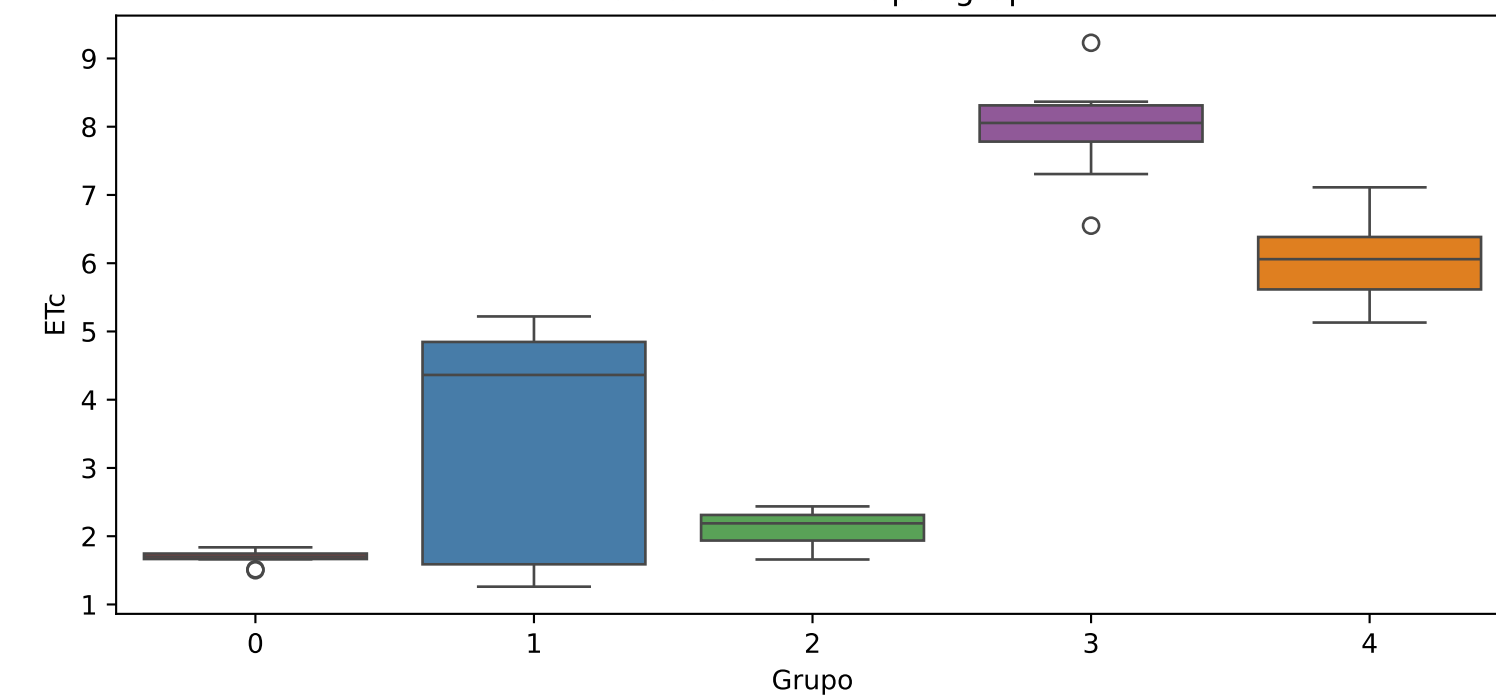
## Distribución de Rs por grupo



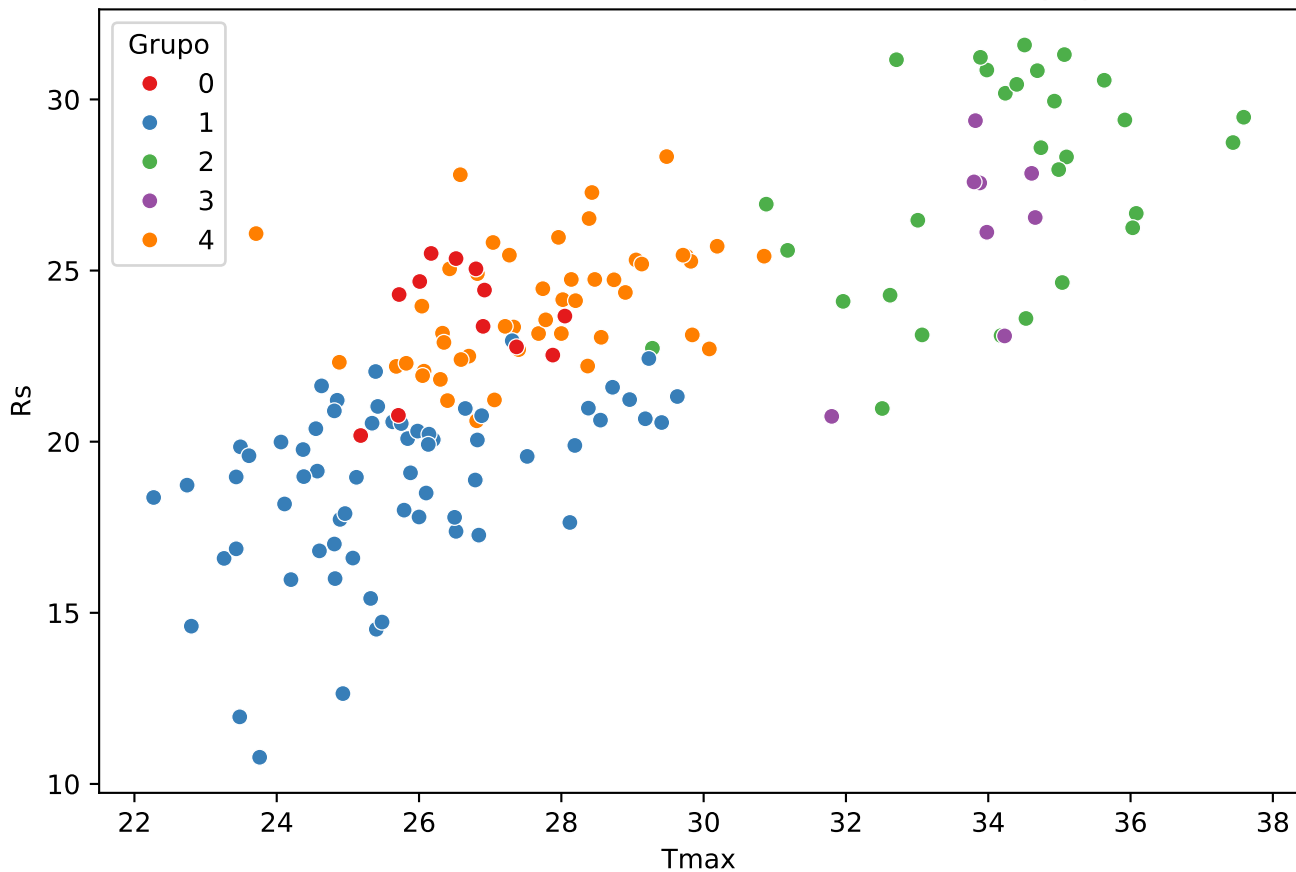
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2020)



## **Zapopan — 2021**

Días del ciclo: 161

ETc total [mm]: 612.5

ETverde total [mm]: 322.6

ETazul total [mm]: 289.9

Tmax / Tmin [°C]: 36.8 / 12.4

## Zapopan — 2021 · Resultados y métricas

[Zapopan 2021] Regresión Lineal ET0 —  $R^2$ : 0.9891 MSE: 0.0193

[Zapopan 2021] Random Forest ET0 —  $R^2$ : 0.9696 MSE: 0.0537

Importancias: {'Tmax': 0.3654634674726765, 'Tmin': 0.004827115532818659, 'HR': 0.35455365822664164, 'Ux': 0.018728871663306813, 'Rs': 0.2564268871045565}

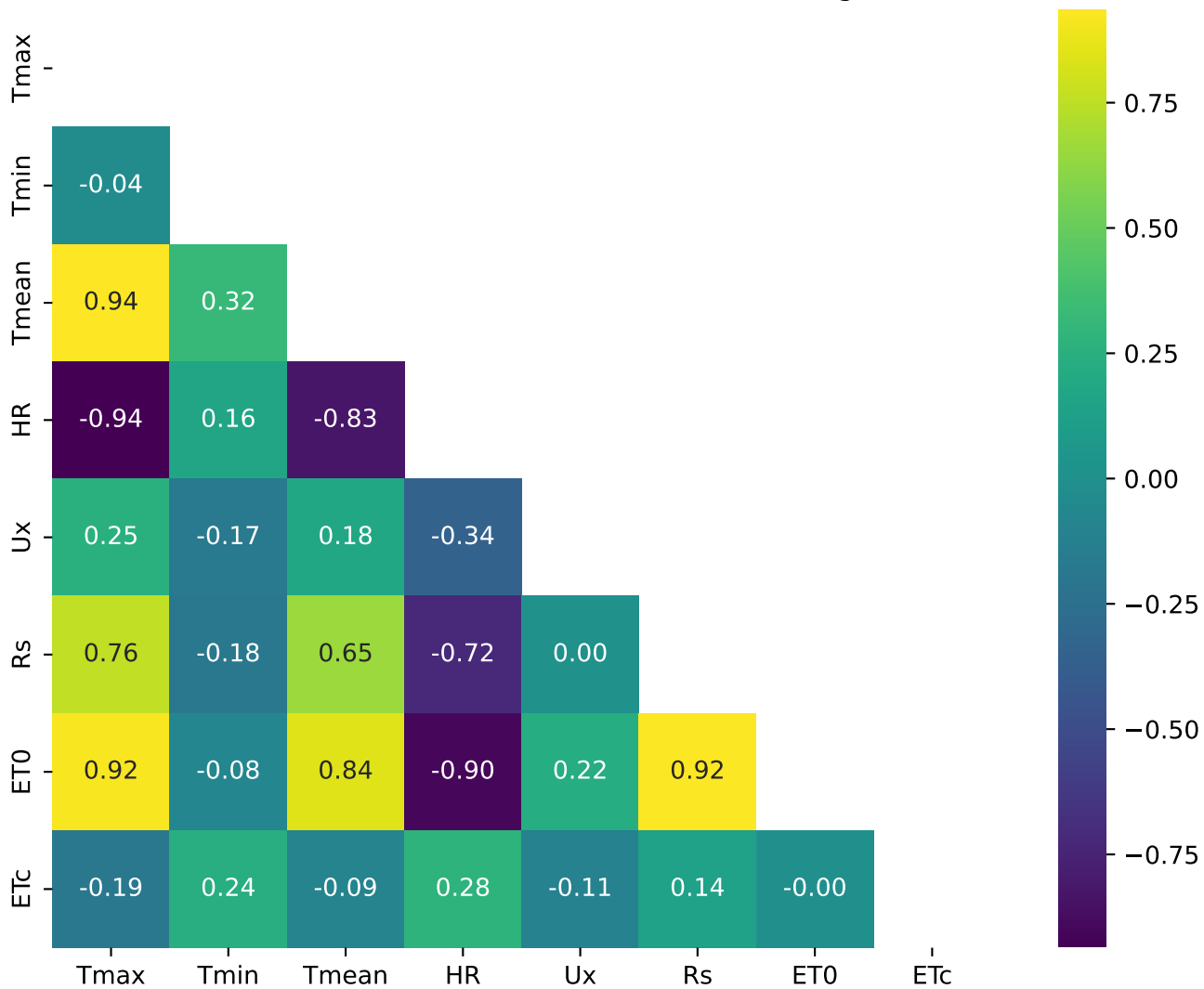
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.104545	14.666364	75.838636	1.272727	20.616818	4.074643	2.051710
1	26.708305	16.820169	76.651695	1.152542	22.626441	4.699383	5.639259
2	34.385833	16.332917	38.528333	1.684167	28.207083	7.164550	2.149365
3	24.885000	17.127800	82.033400	1.000400	16.733000	3.515881	3.246086
4	23.830000	16.033333	81.340000	3.066667	11.581667	2.883850	3.460619

**Zapopan — 2021**

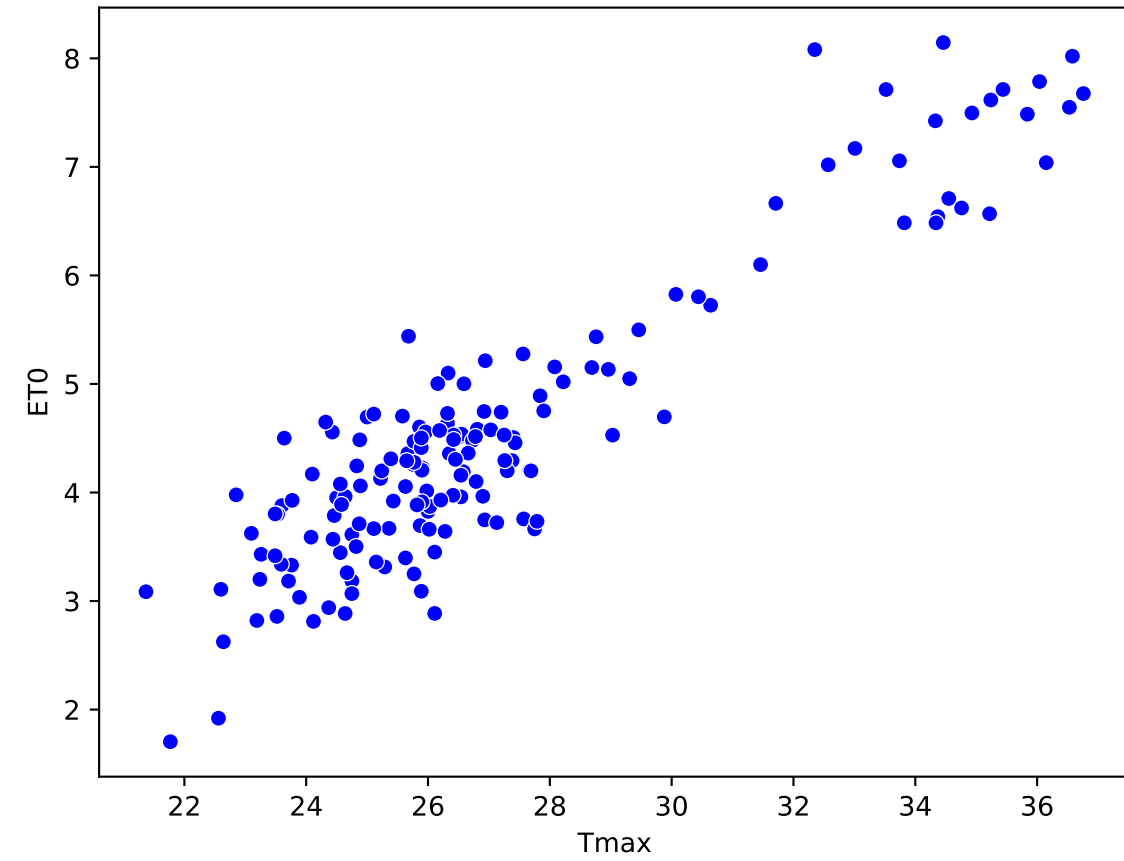


Matriz de Correlación entre Variables Meteorológicas

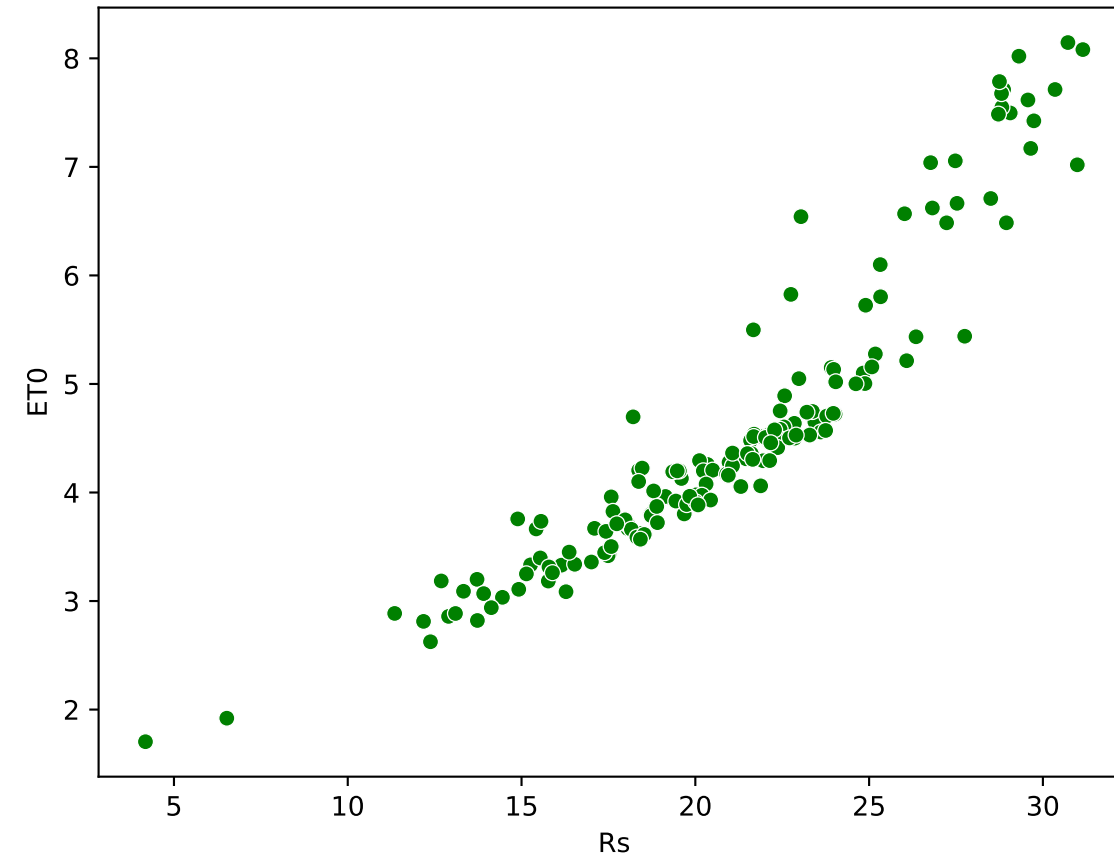


# Dispersión — Zapopan (2021)

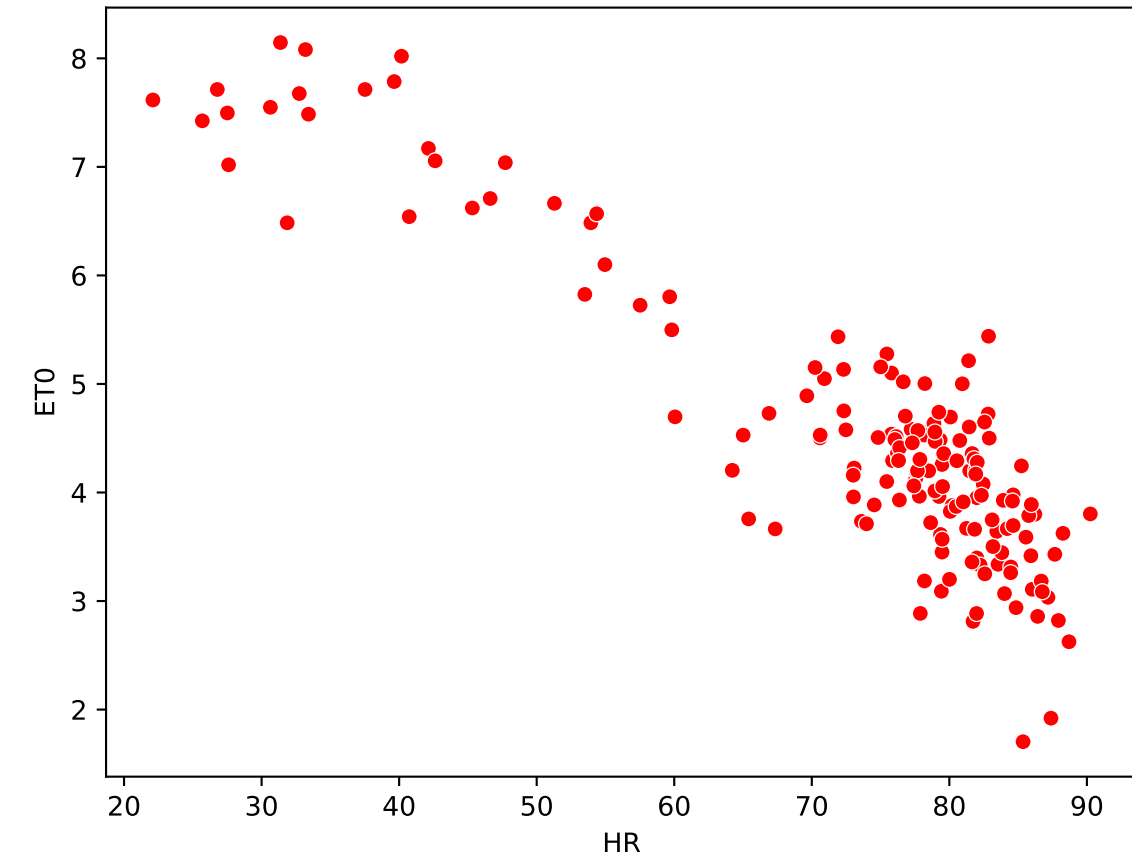
Tmax vs ET0



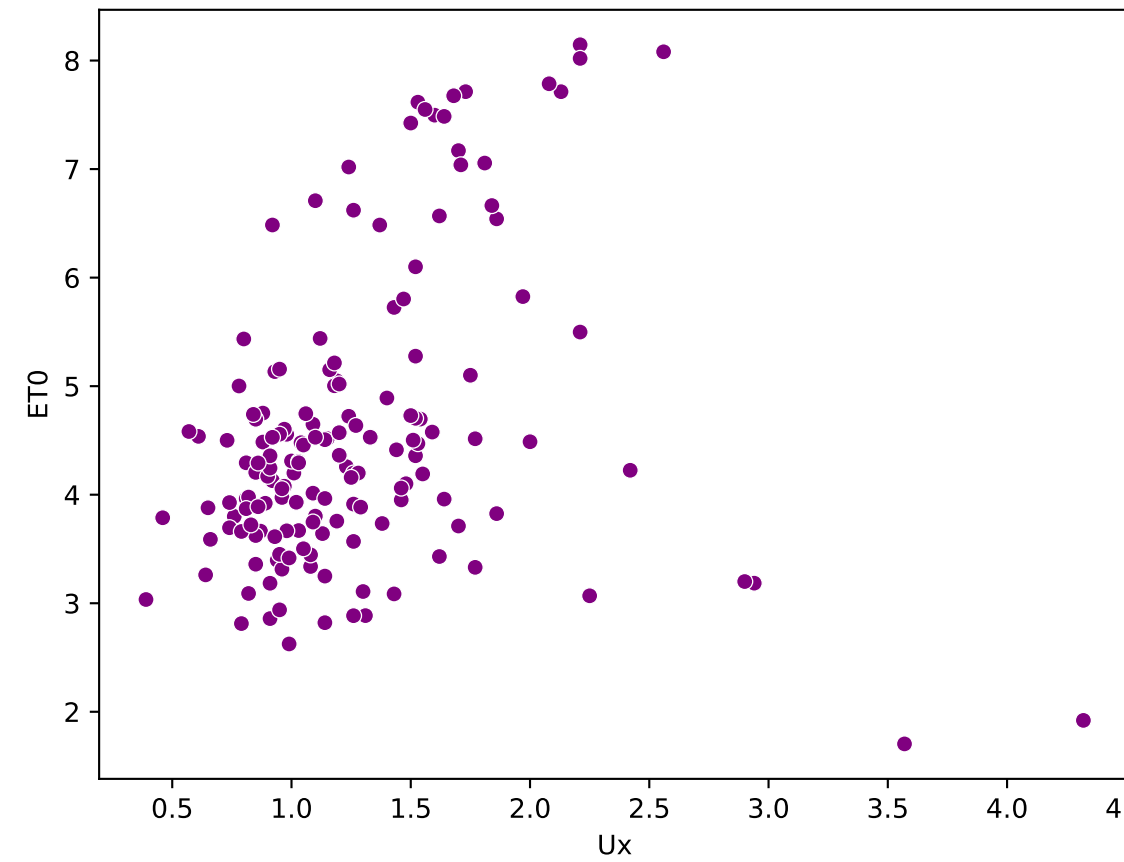
Rs vs ET0



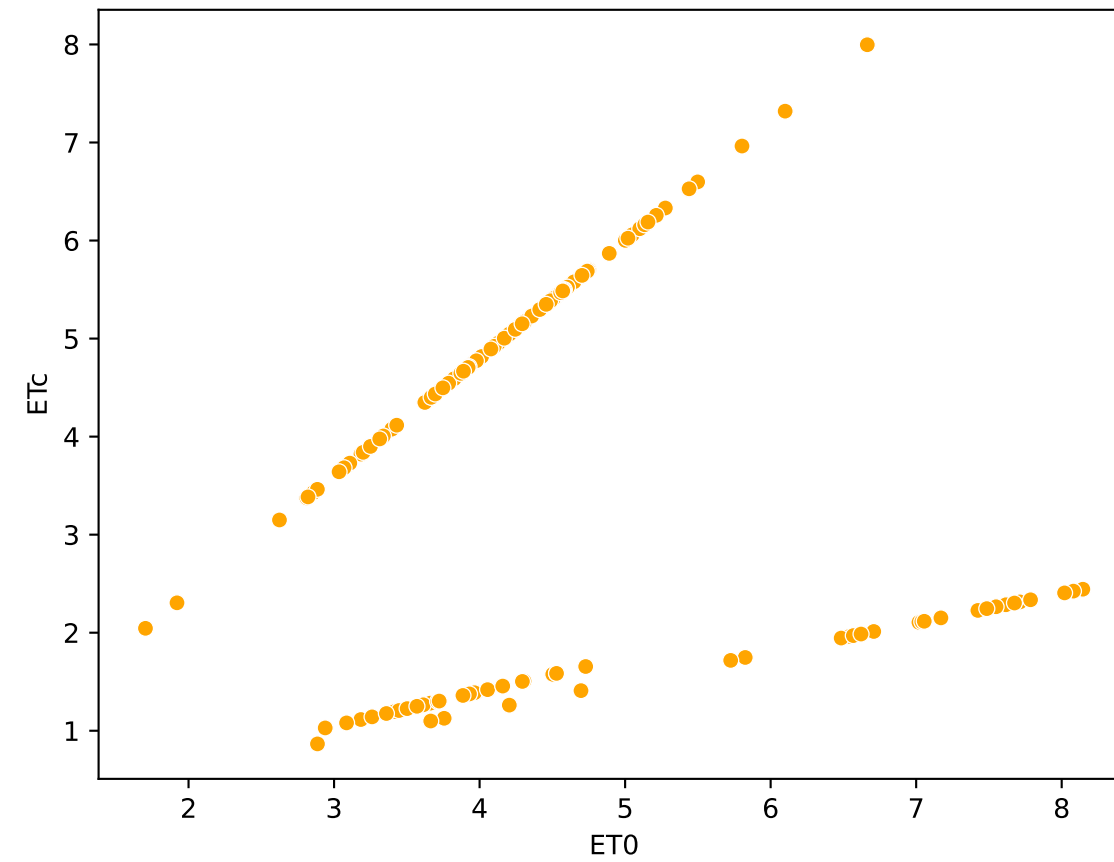
HR vs ET0



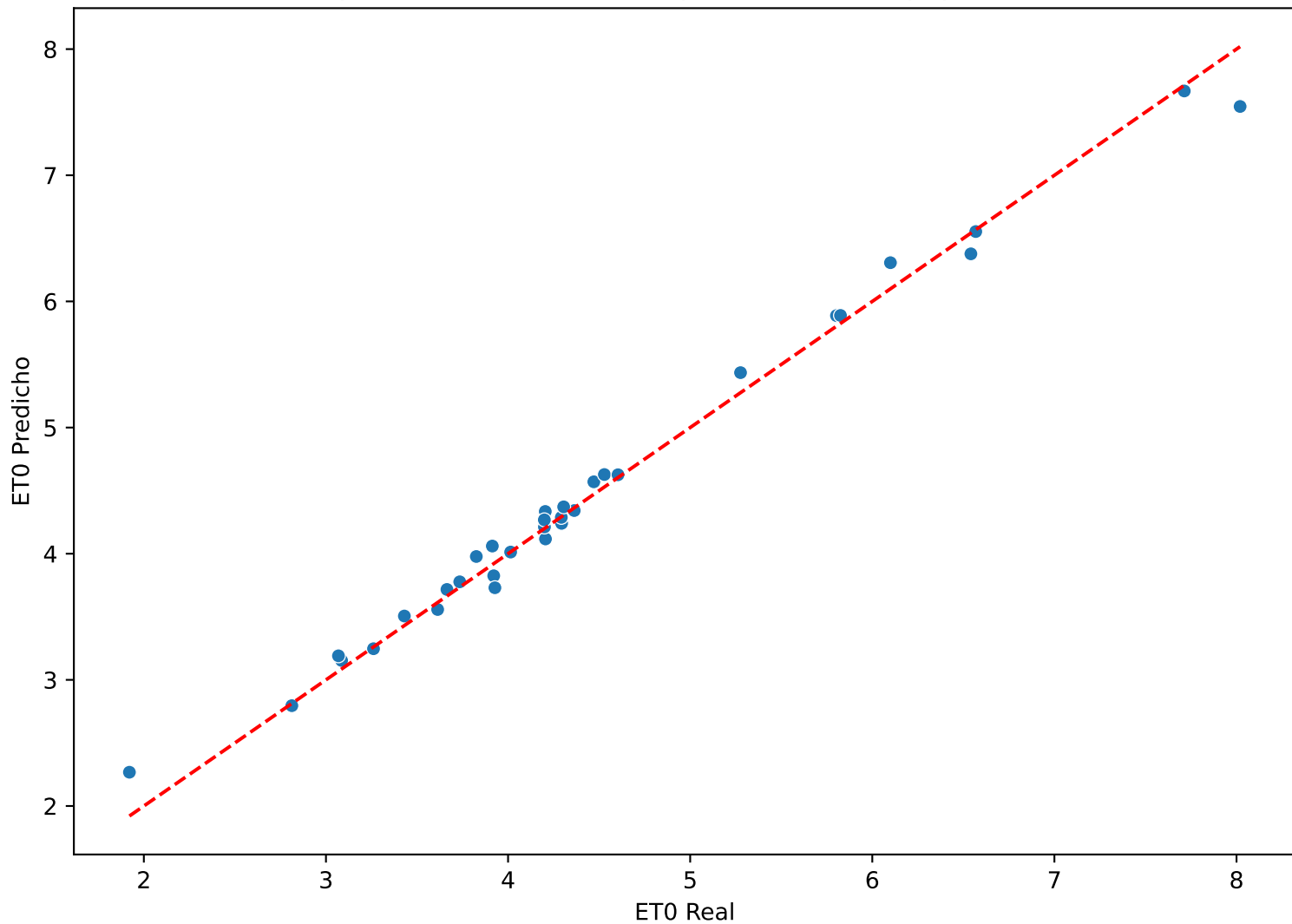
Ux vs ET0



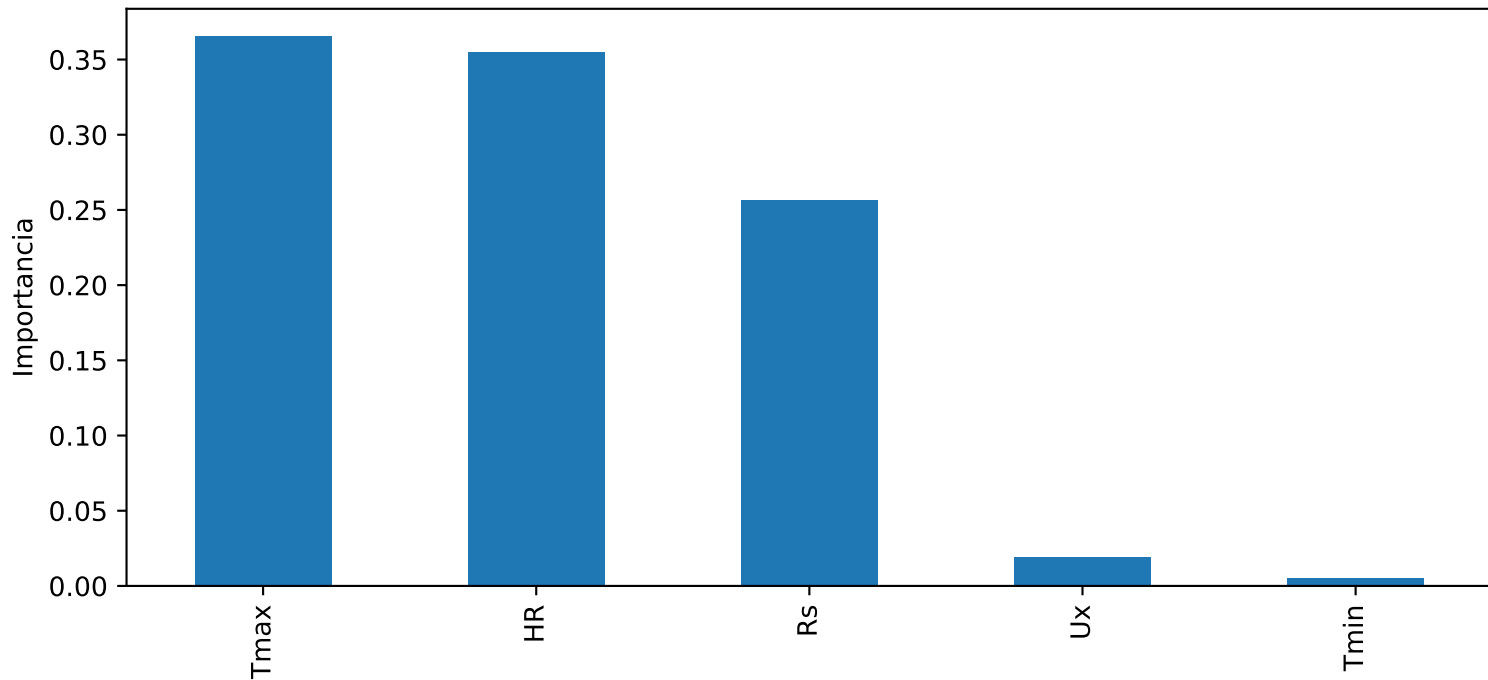
ET0 vs ETc



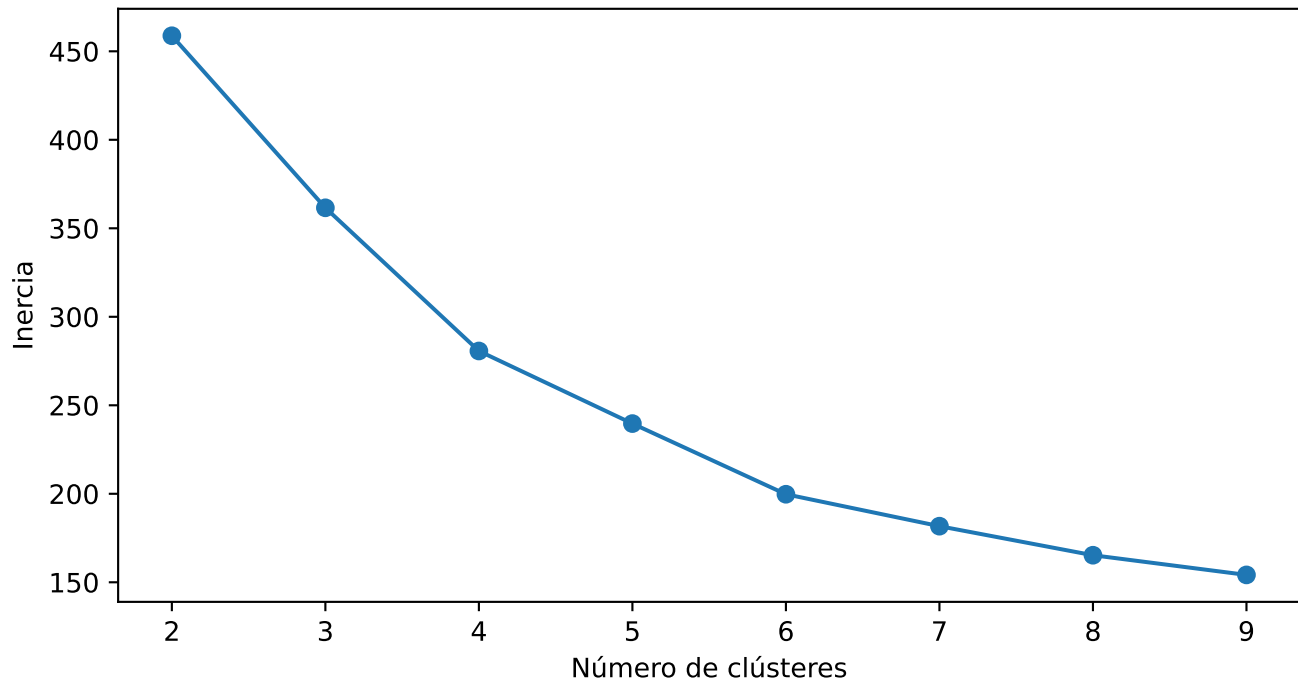
Comparación entre ET0 Real y Predicho — Zapopan (2021)



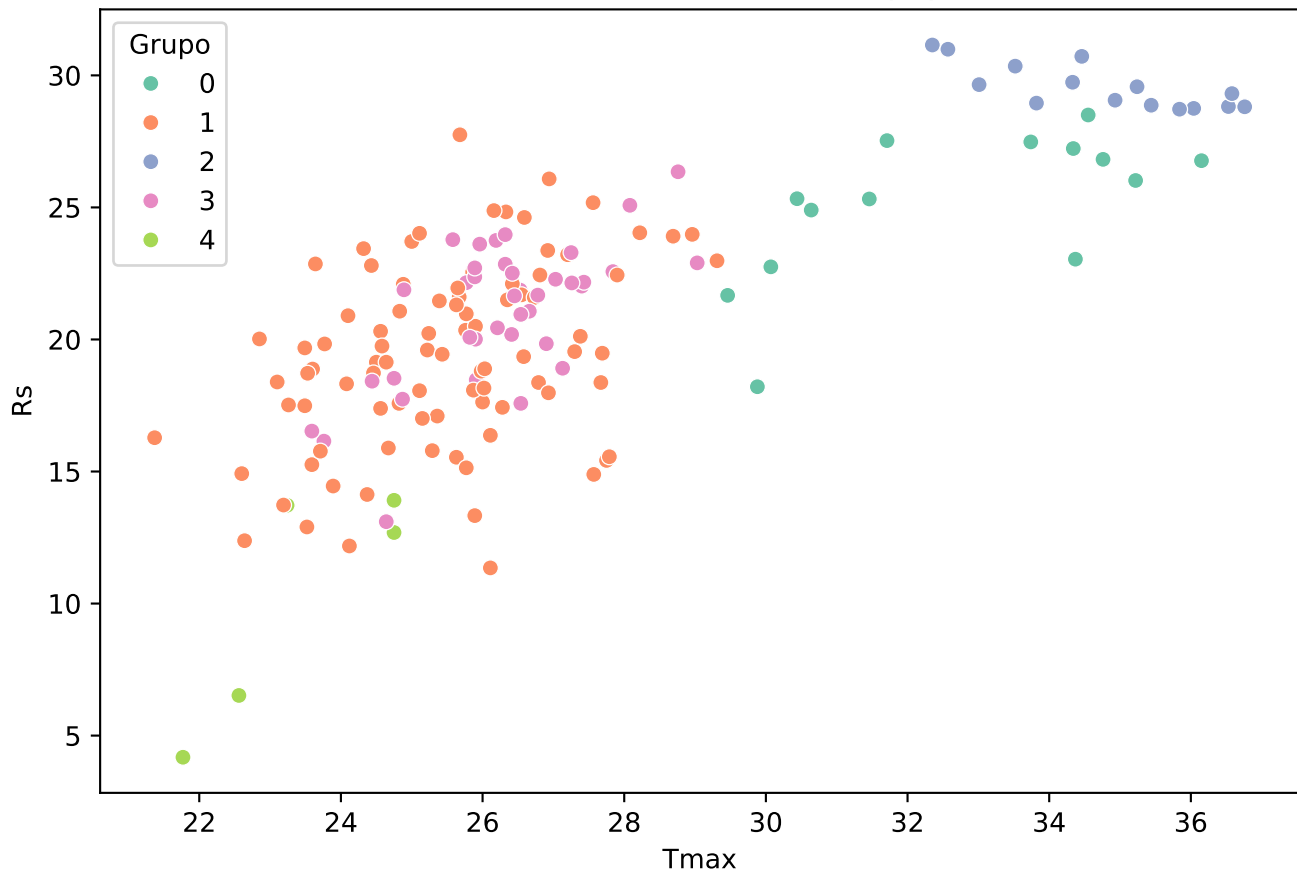
Importancia de variables (RF) — Zapopan (2021)



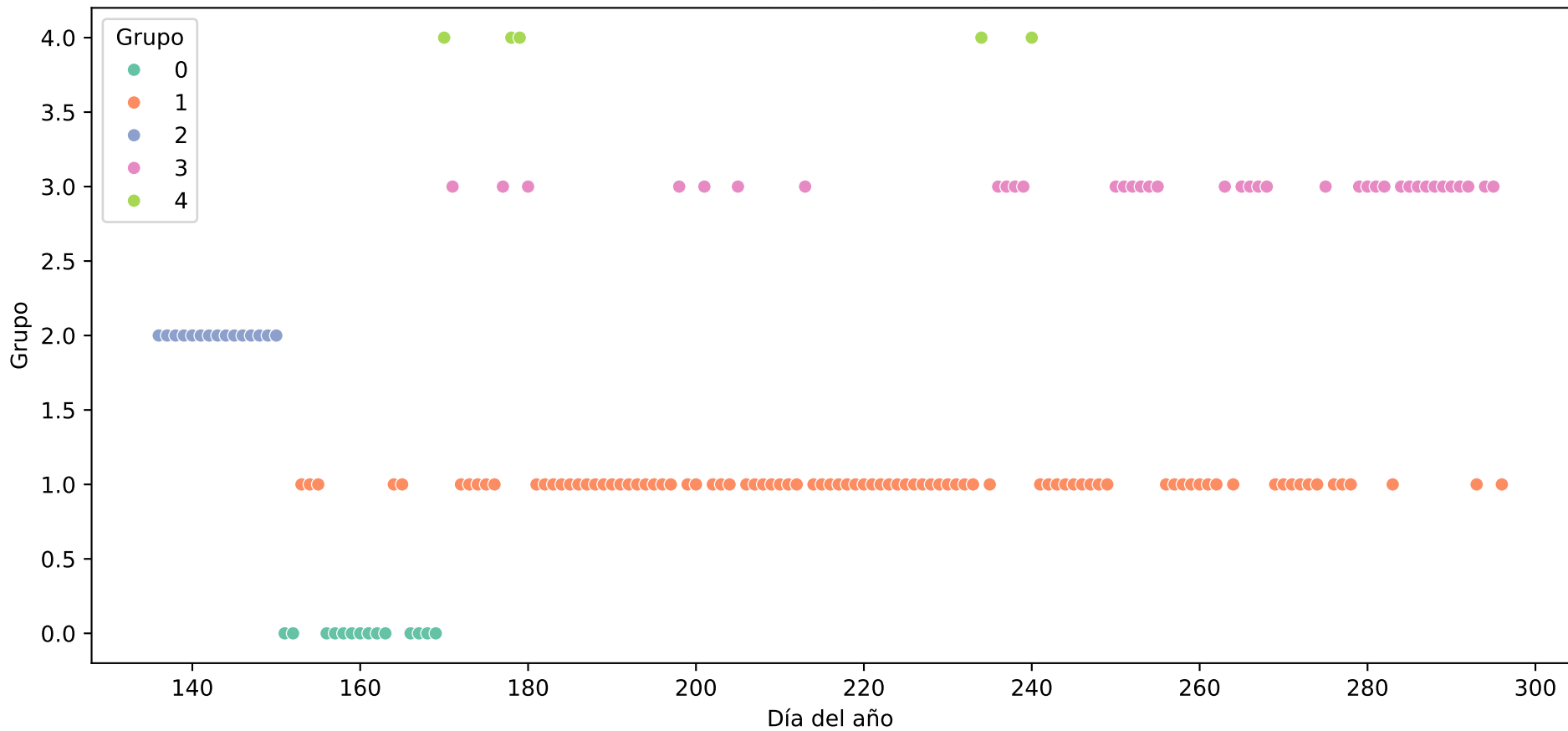
## Método del codo



Clasificación de días climáticos — Zapopan (2021)

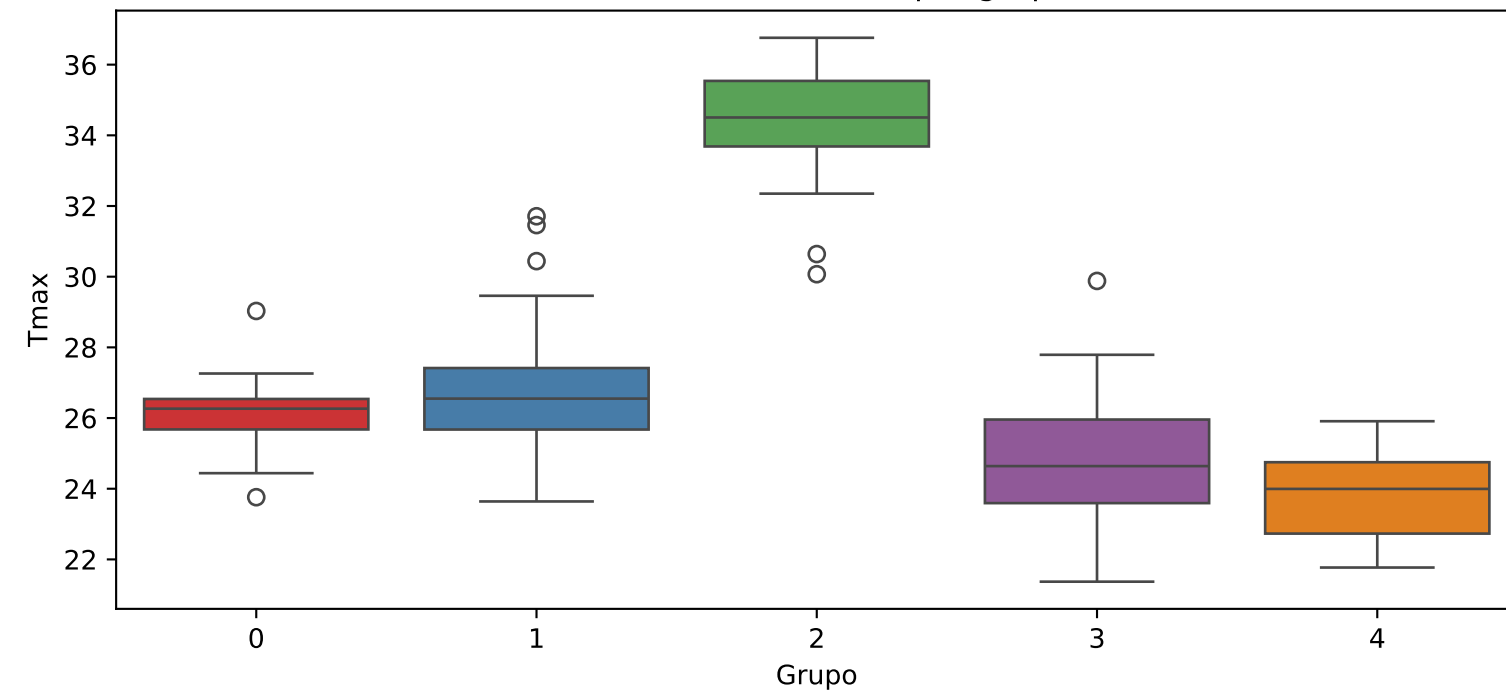


Distribución de días por grupo — Zapopan (2021)

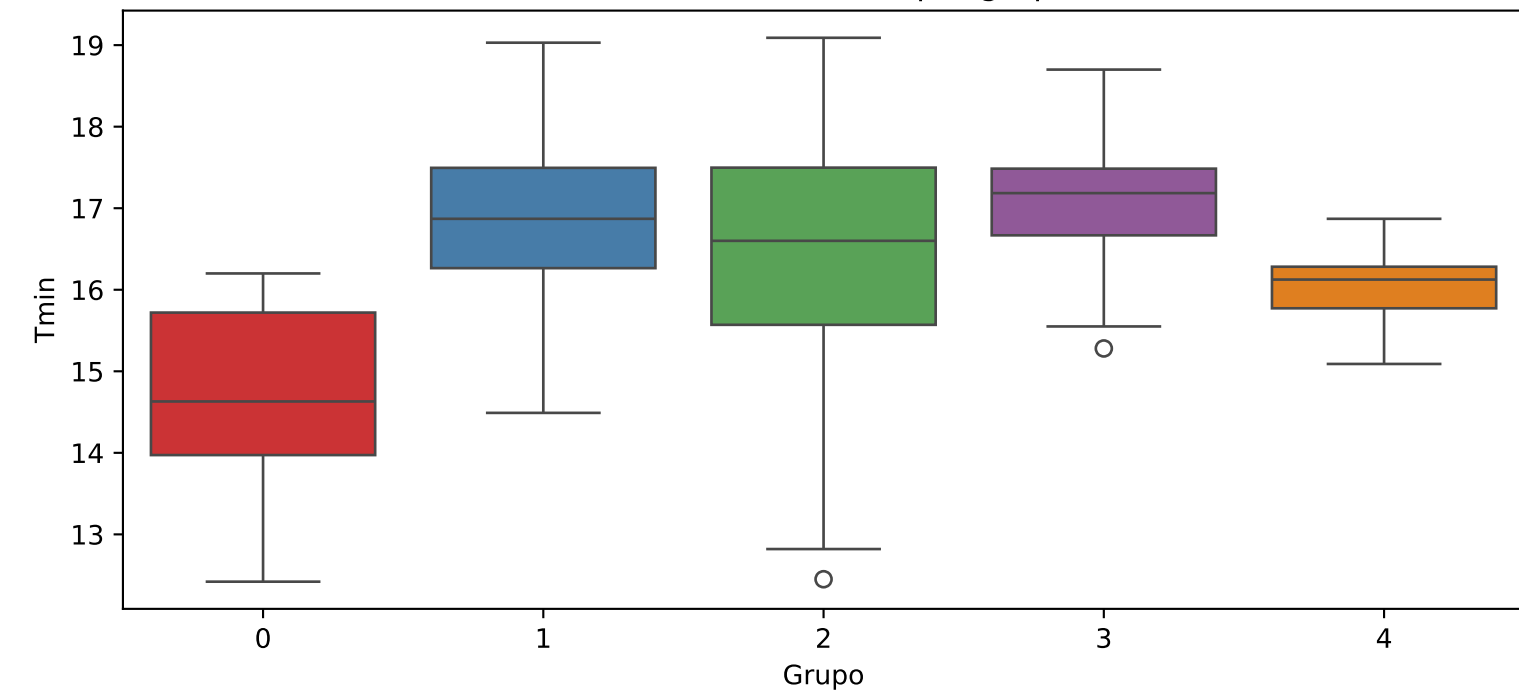


# Boxplots por grupo — Zapopan (2021)

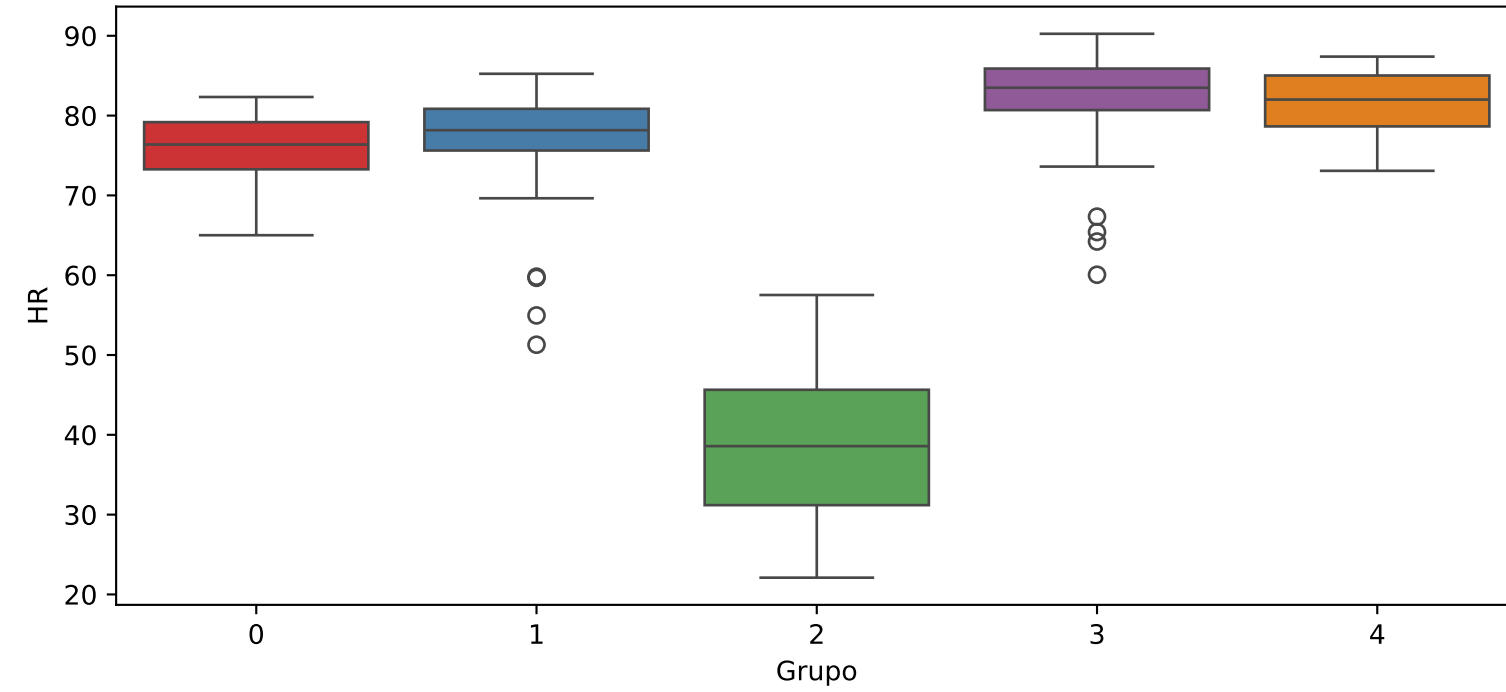
## Distribución de Tmax por grupo



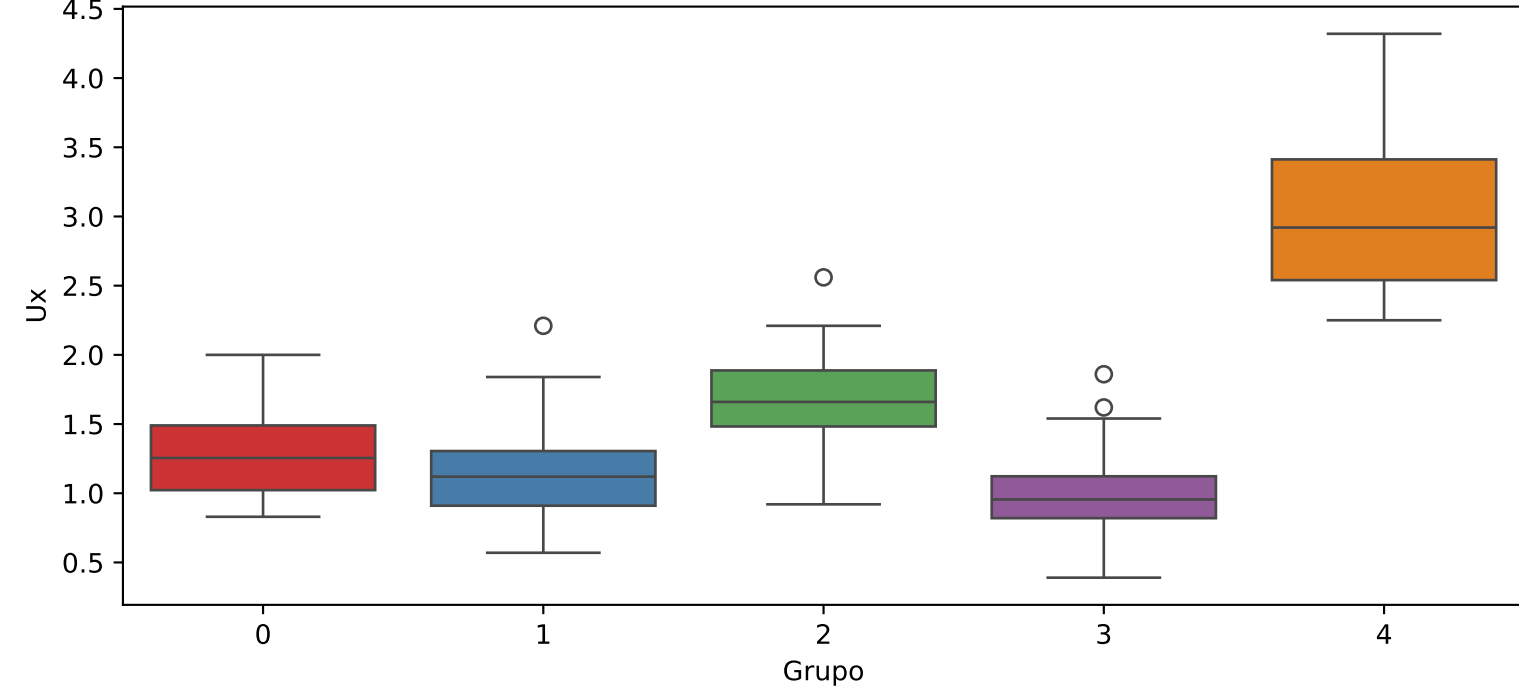
## Distribución de Tmin por grupo



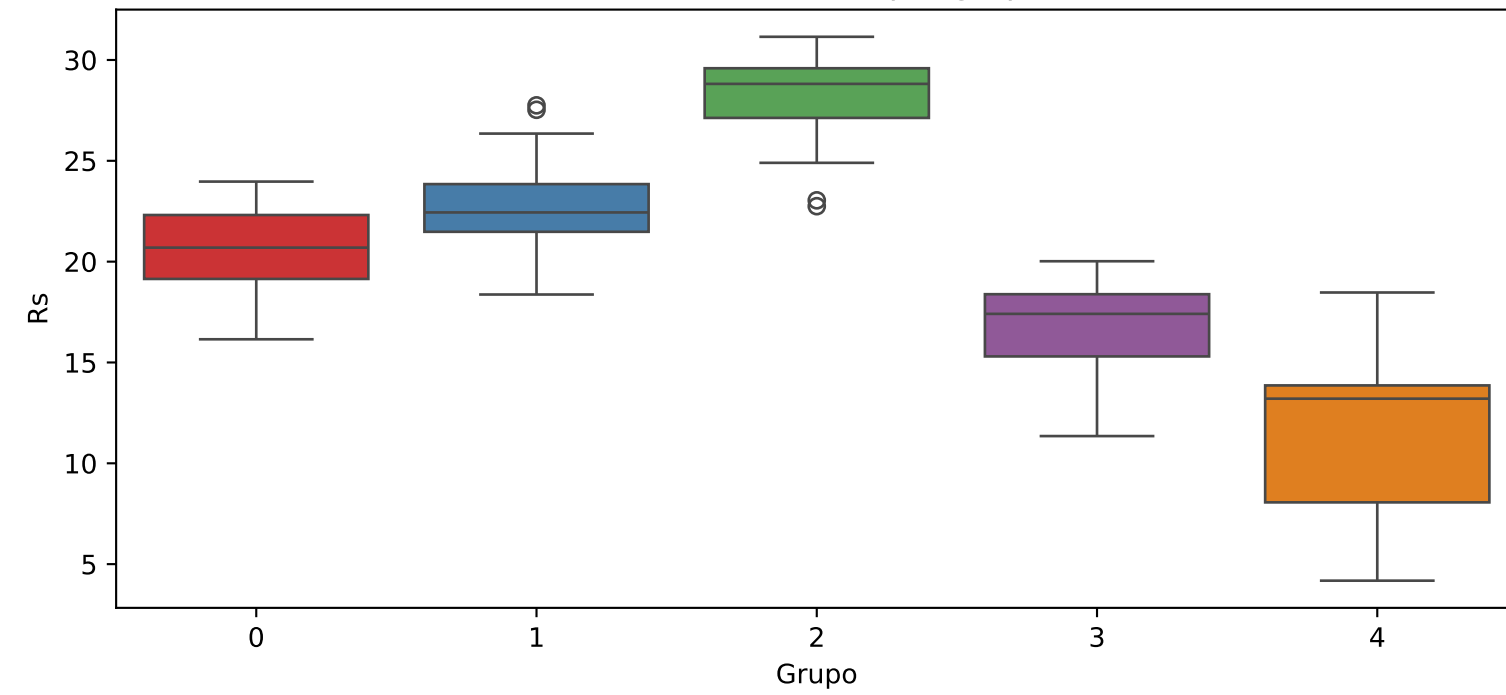
## Distribución de HR por grupo



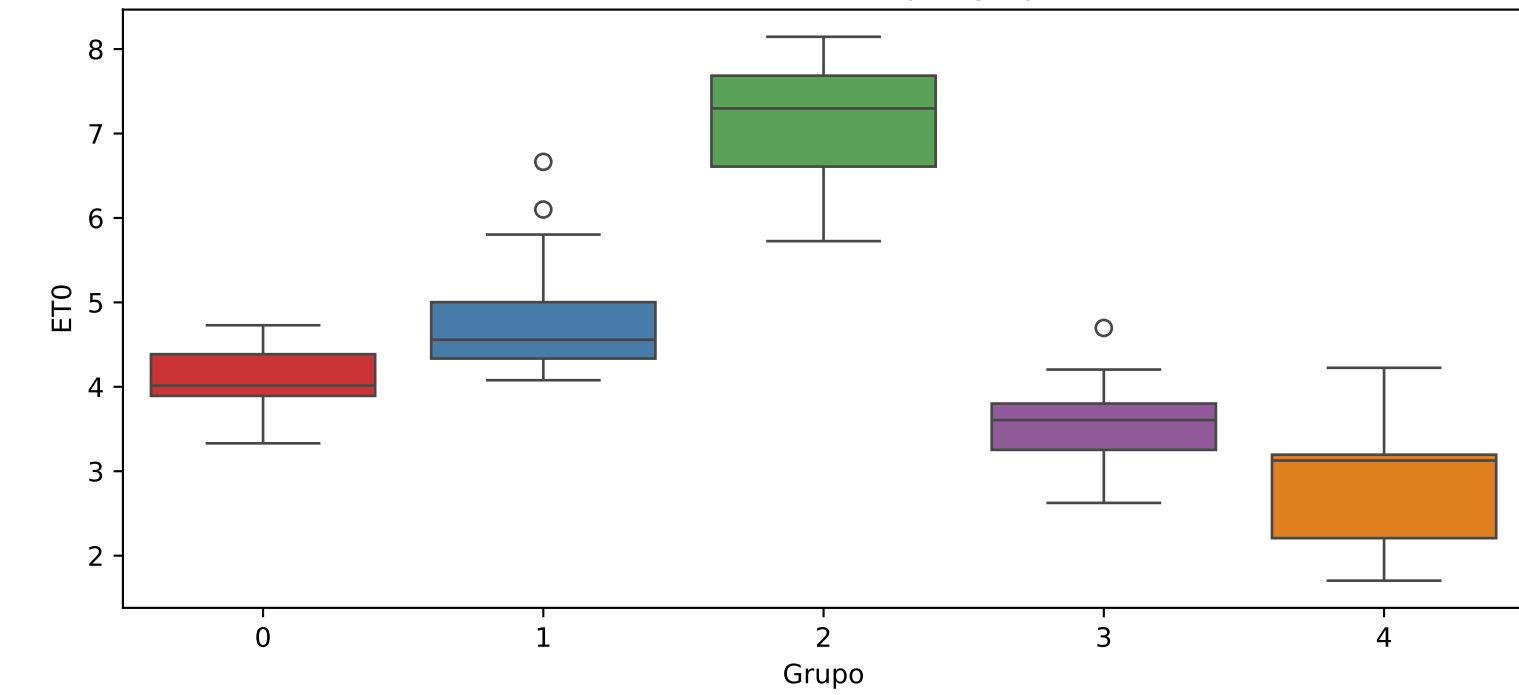
## Distribución de Ux por grupo



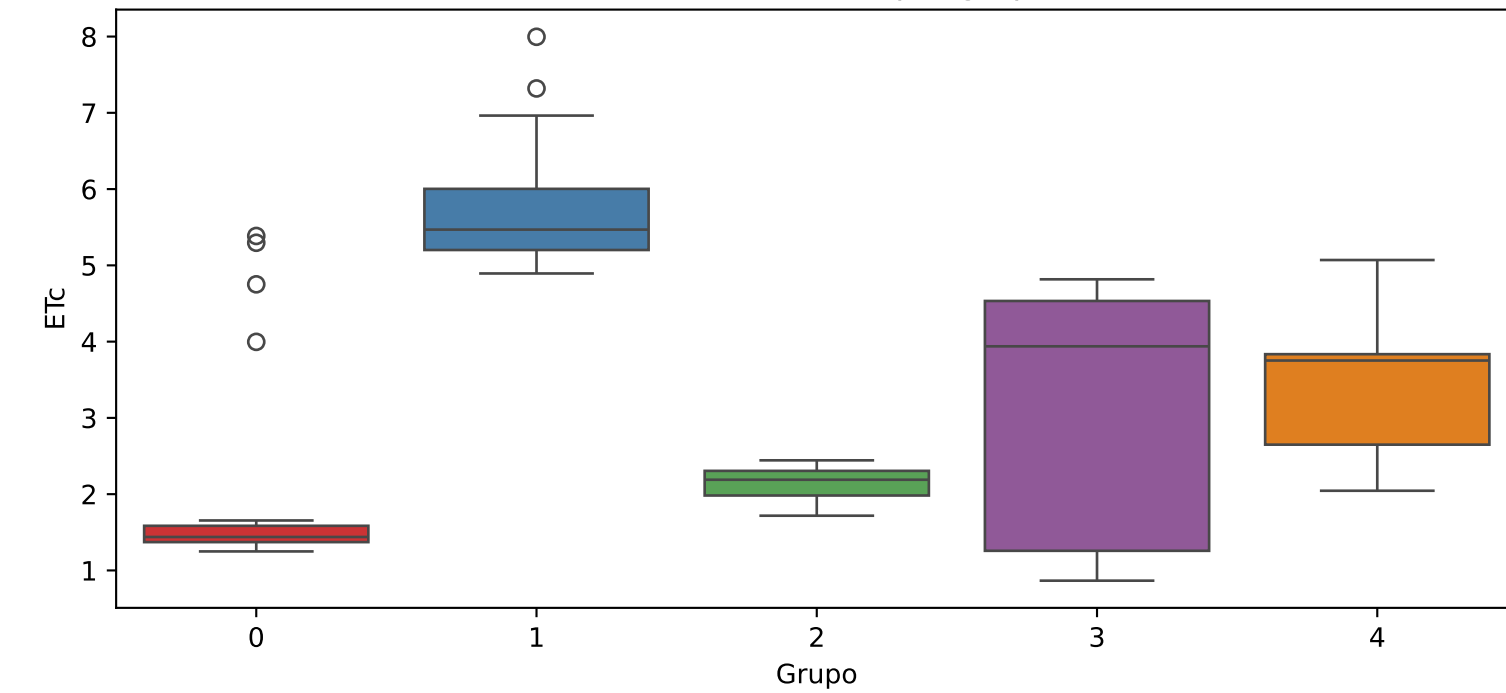
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

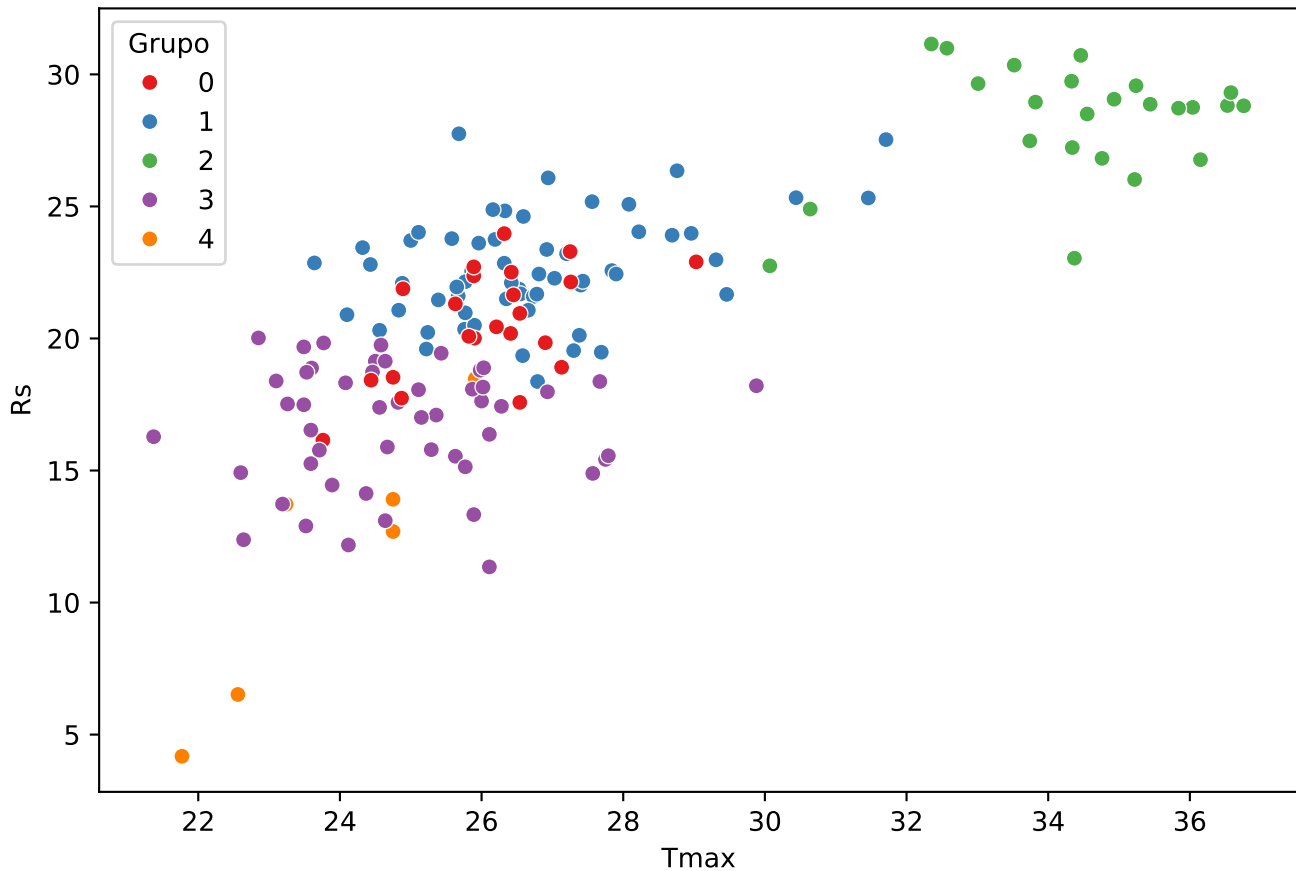


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2021)



## **Zapopan — 2022**

Días del ciclo: 161

ETc total [mm]: 630.1

ETverde total [mm]: 353.4

ETazul total [mm]: 276.7

Tmax / Tmin [°C]: 36.4 / 11.5

**Zapopan — 2022 · Resultados y métricas**

[Zapopan 2022] Regresión Lineal ET0 — R²: 0.9837 MSE: 0.0230

[Zapopan 2022] Random Forest ET0 — R²: 0.9427 MSE: 0.0806

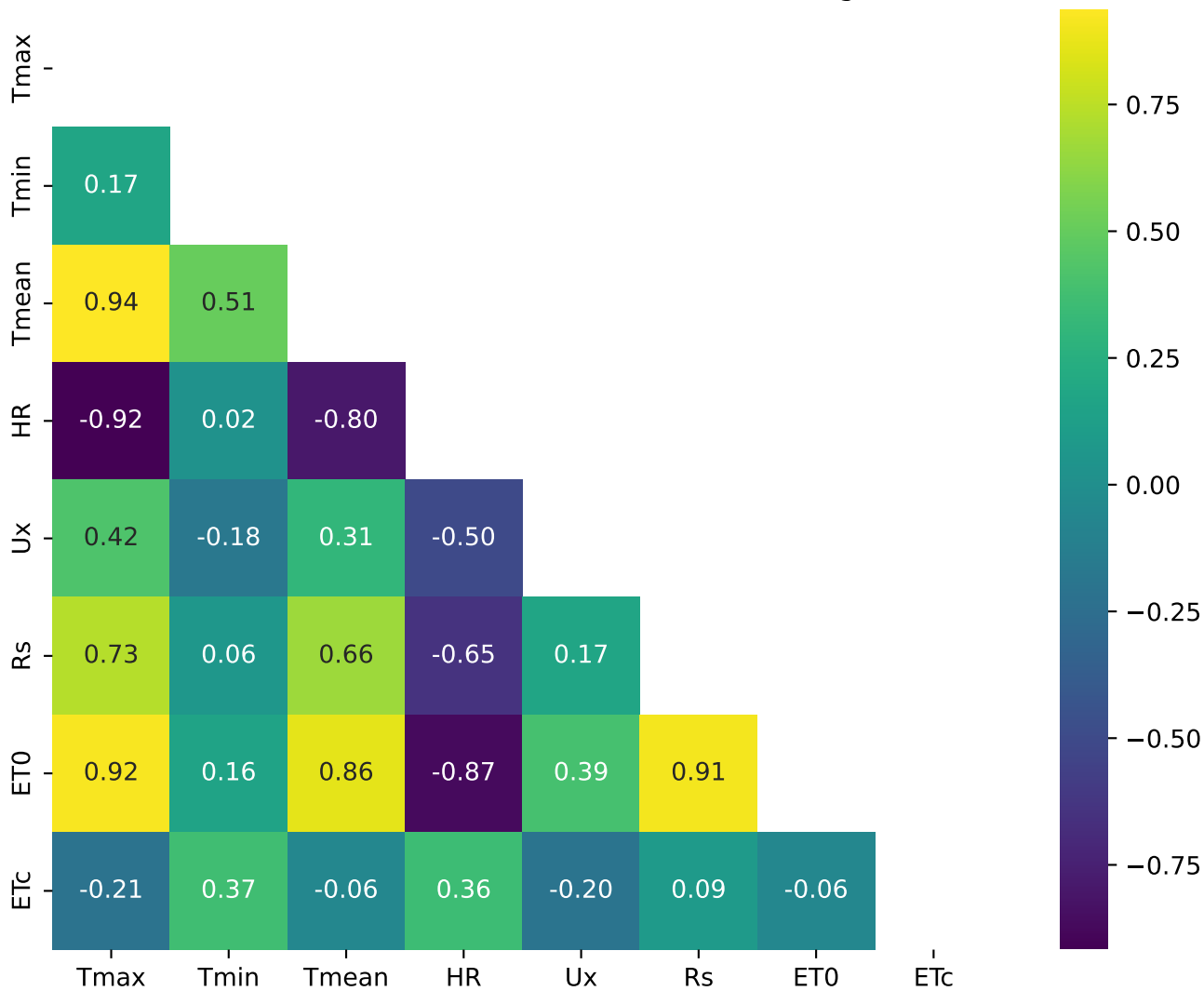
Importancias: {'Tmax': 0.6330028684291222, 'Tmin': 0.01386559374779298, 'HR': 0.07686572007362855, 'Ux': 0.010424469283617715, 'Rs': 0.2658413484658386}

Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.344167	16.742500	75.411667	2.125000	17.352500	4.003455	4.804146
1	25.327000	16.905400	79.923600	0.927400	18.523600	3.850246	3.688105
2	34.470833	16.945000	42.080417	1.637083	27.238333	6.957002	2.087101
3	24.849048	13.901905	74.174286	1.376667	19.306667	3.831490	1.341021
4	26.787963	16.964815	76.412222	1.028519	23.137963	4.781205	5.737446

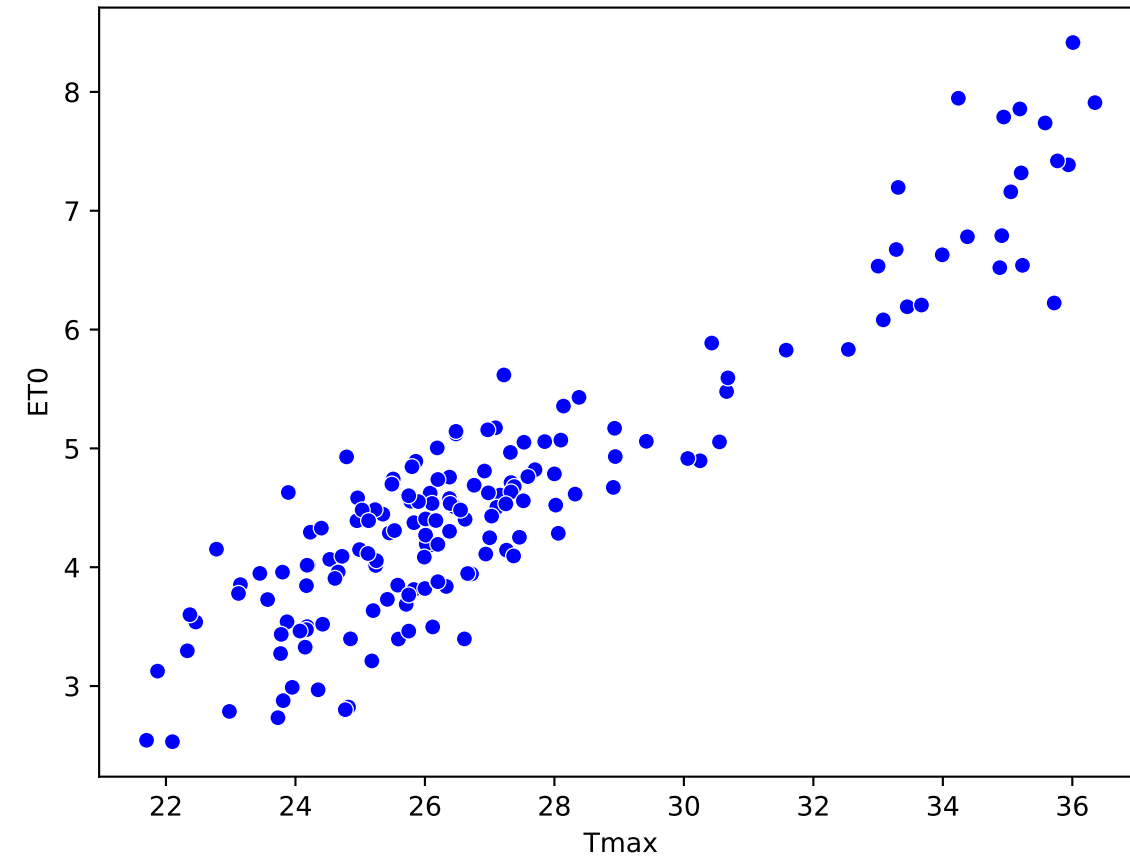
**Zapopan — 2022**

Matriz de Correlación entre Variables Meteorológicas

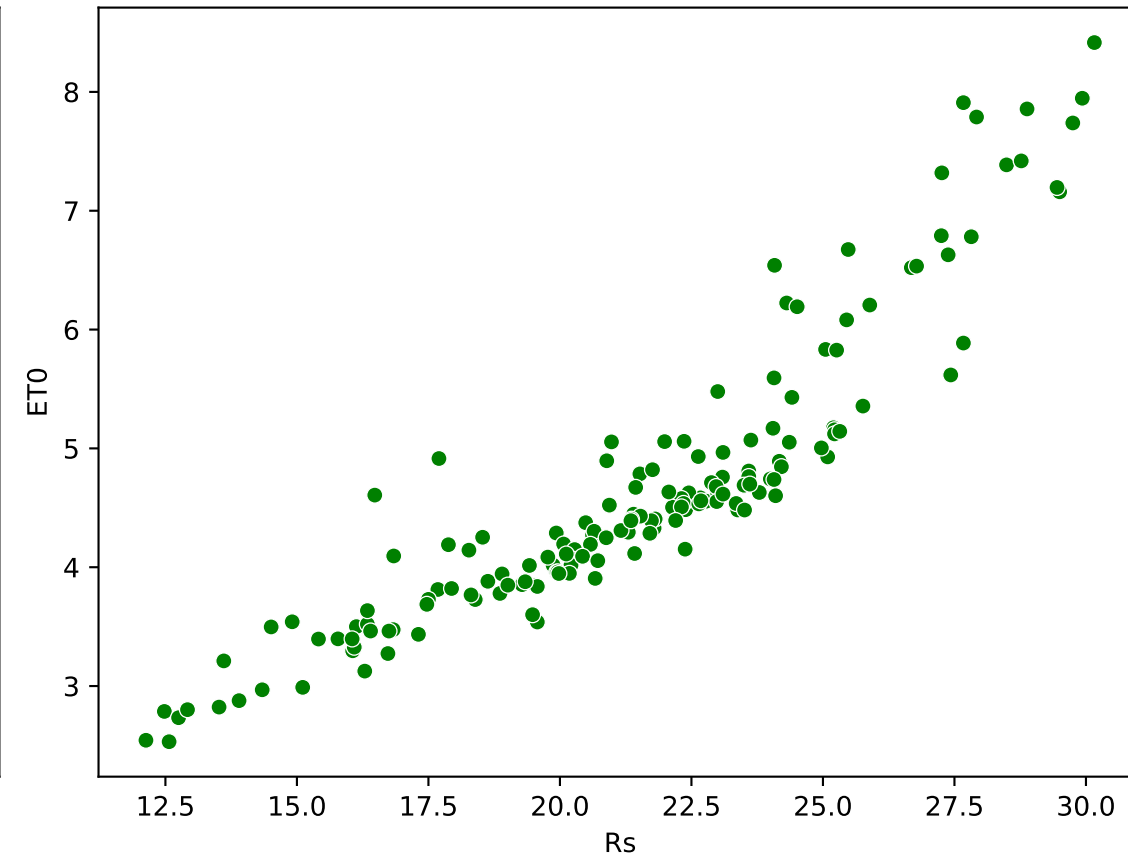


# Dispersión — Zapopan (2022)

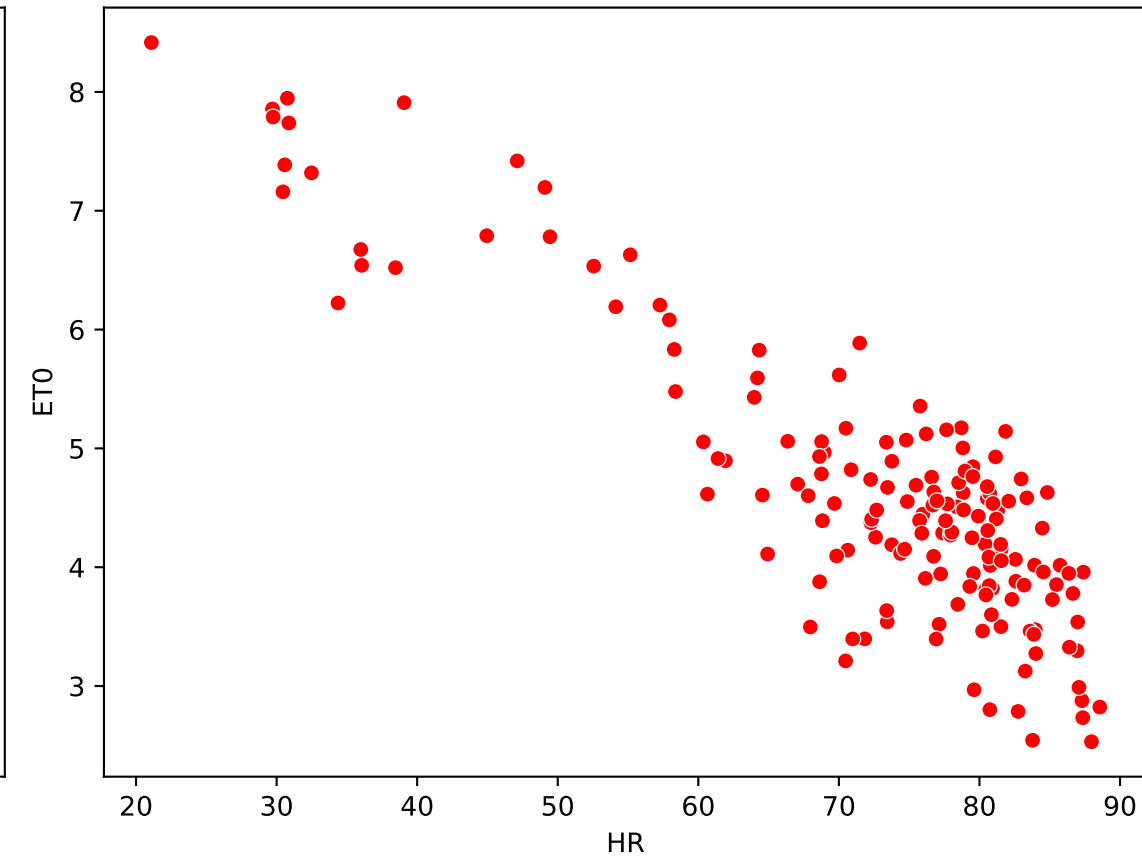
## Tmax vs ET0



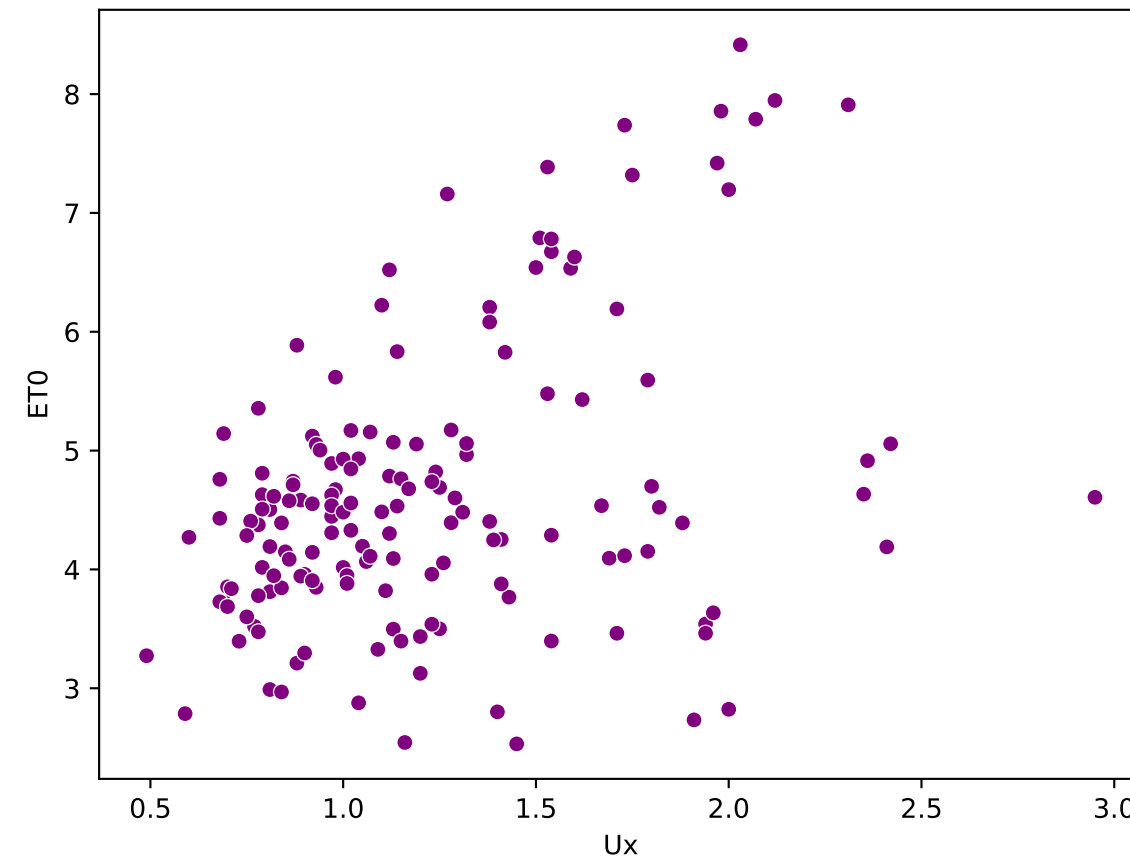
## Rs vs ET0



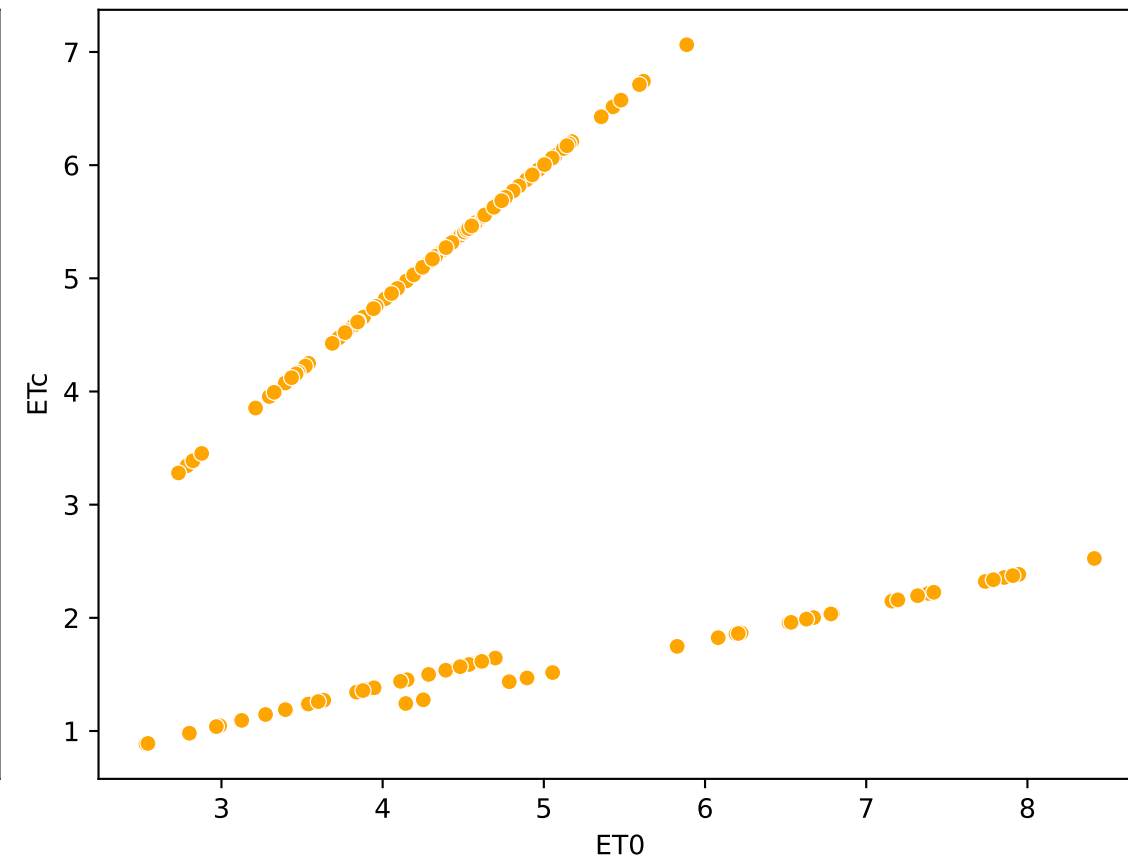
## HR vs ET0



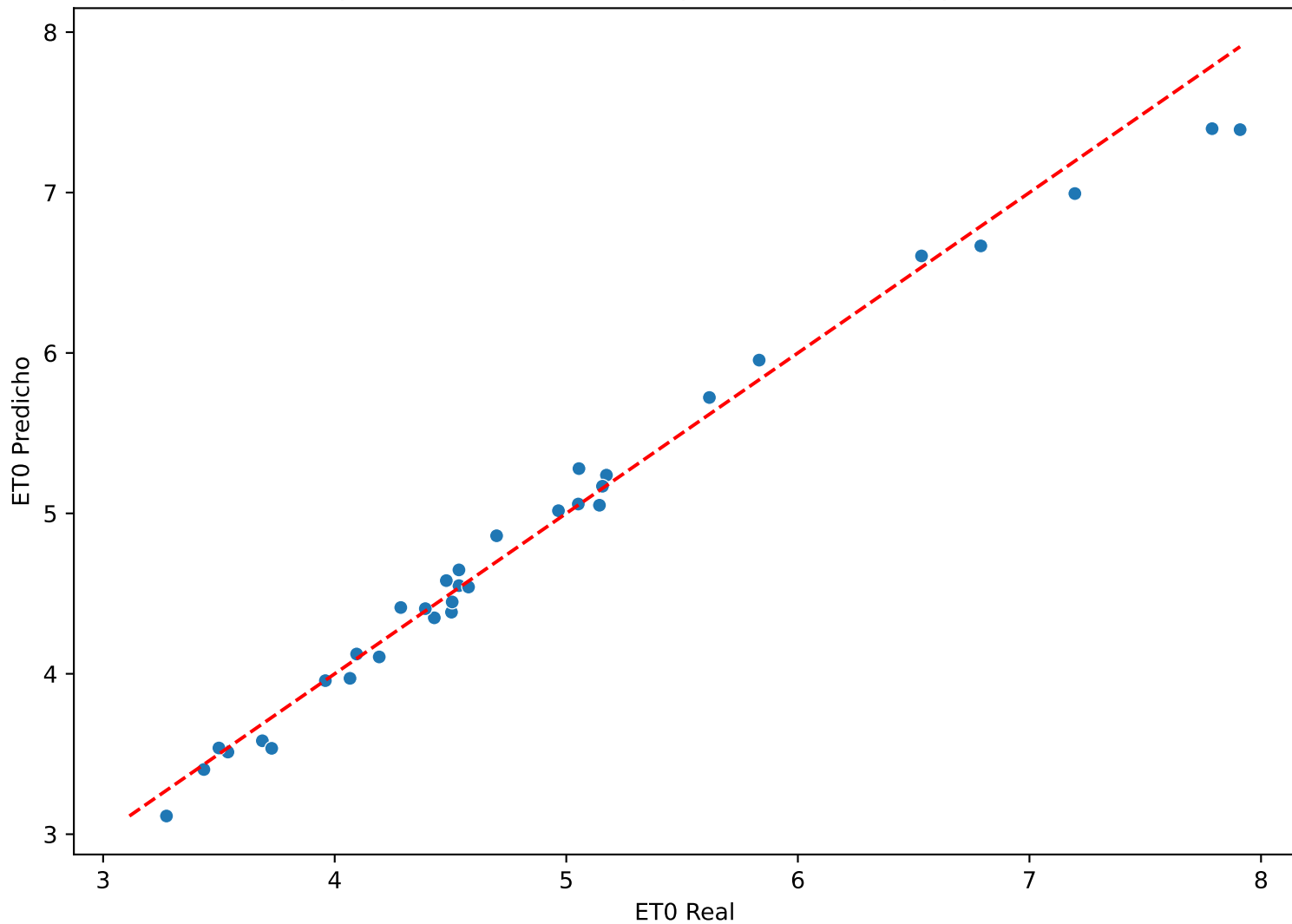
## Ux vs ET0



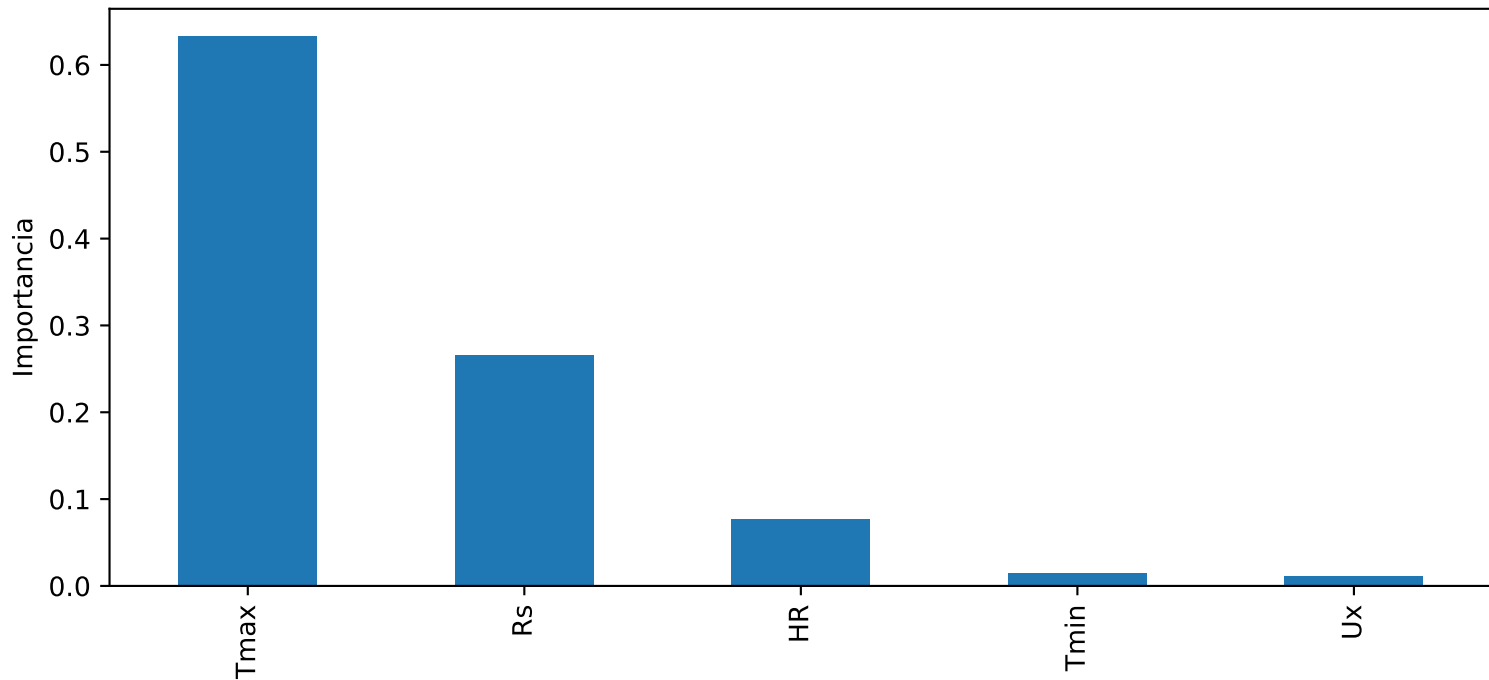
## ET0 vs ETc



Comparación entre ET0 Real y Predicho — Zapopan (2022)

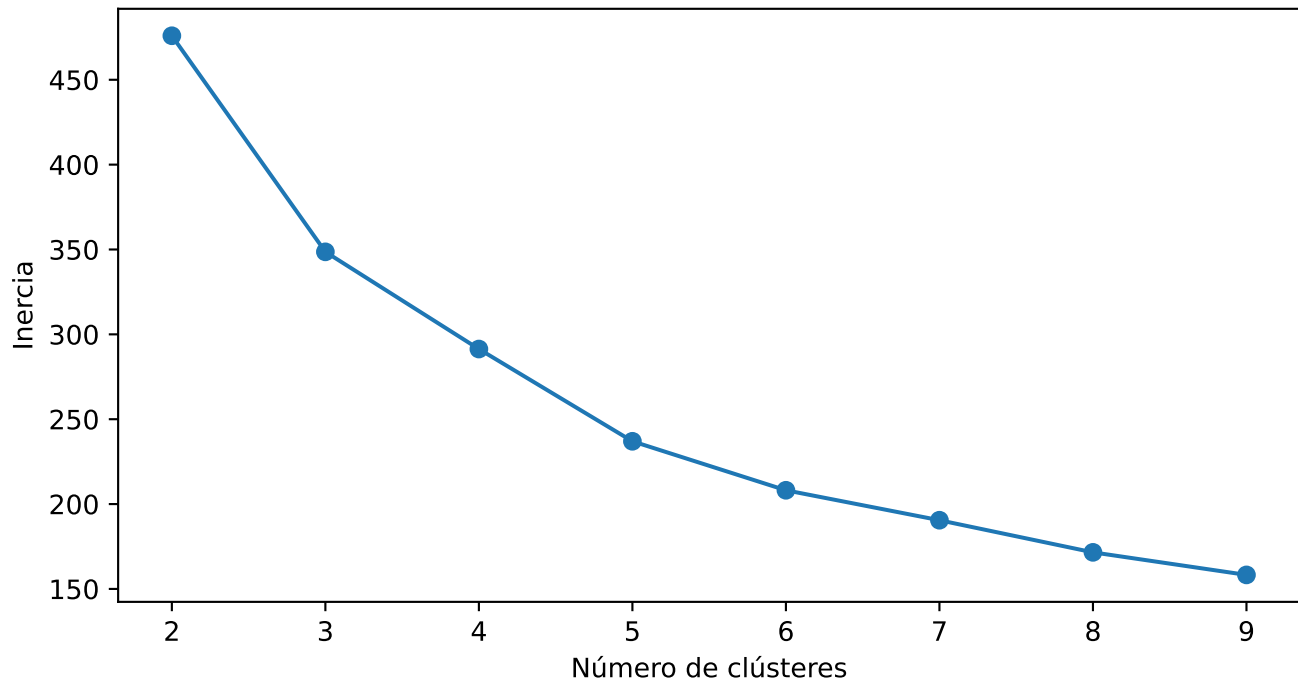


Importancia de variables (RF) — Zapopan (2022)

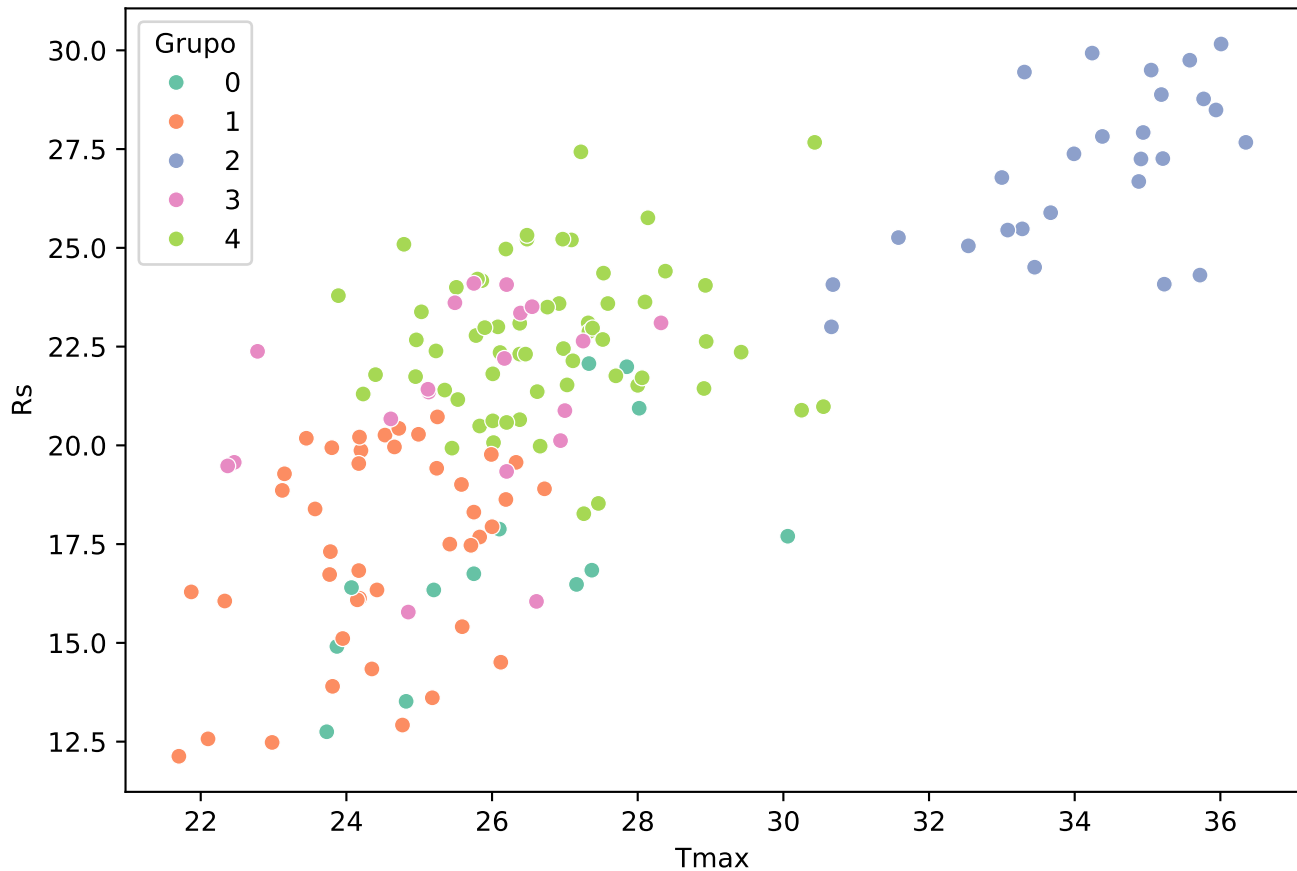




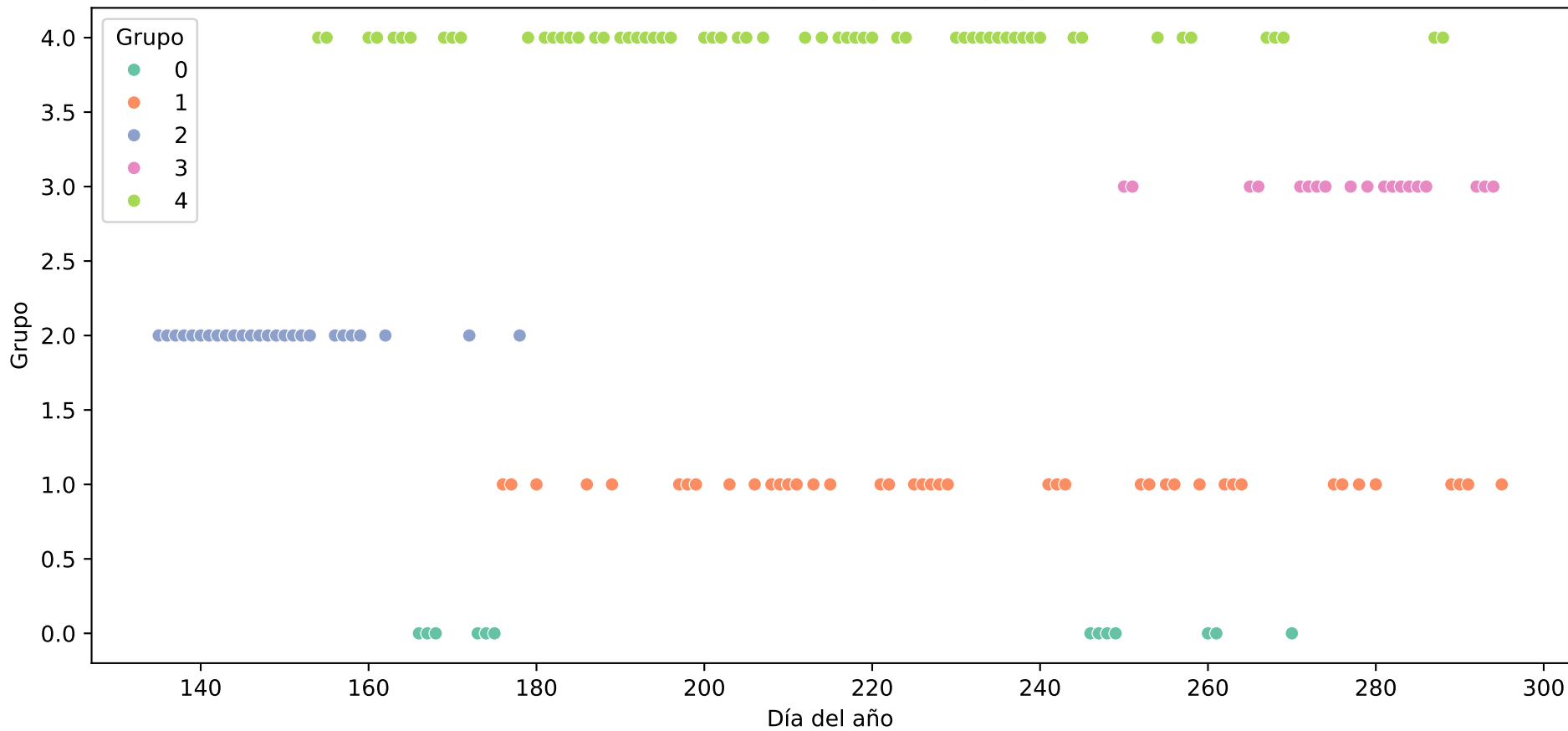
Método del codo



Clasificación de días climáticos — Zapopan (2022)

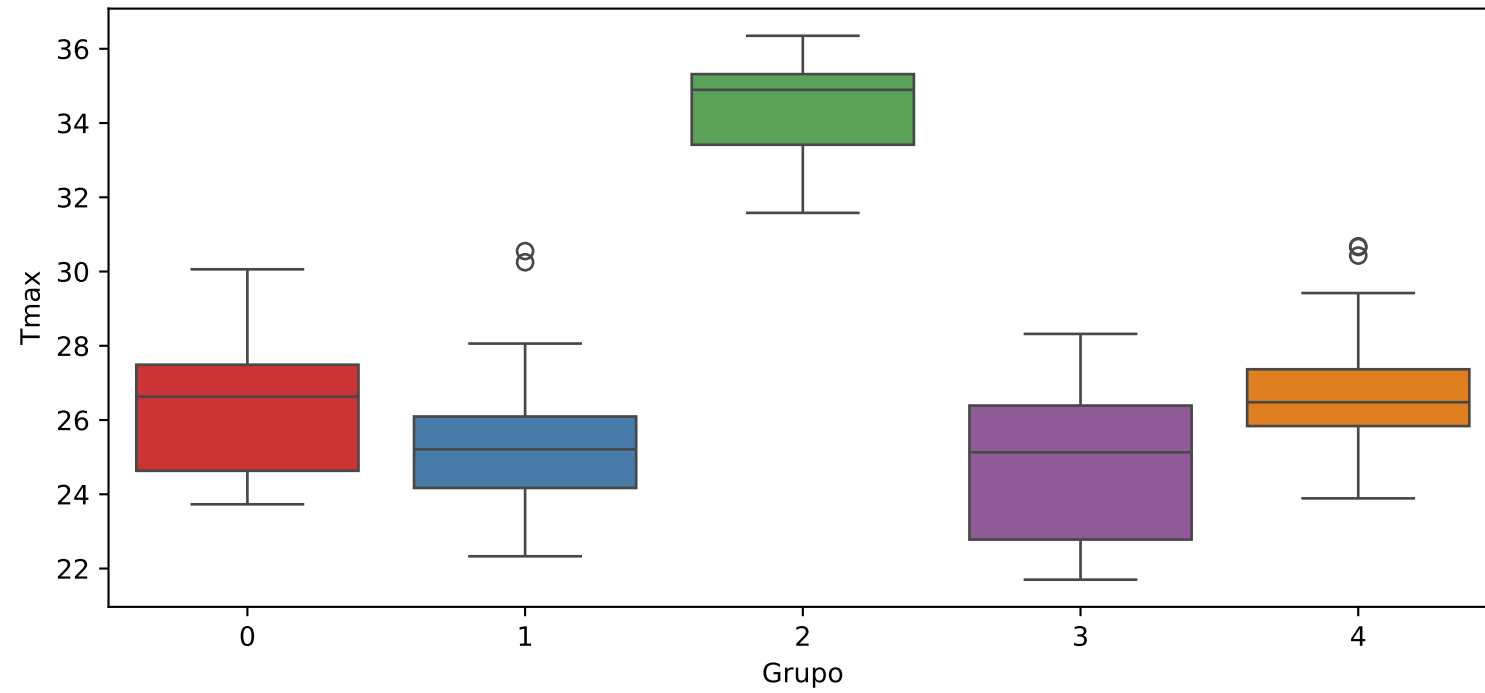


Distribución de días por grupo — Zapopan (2022)

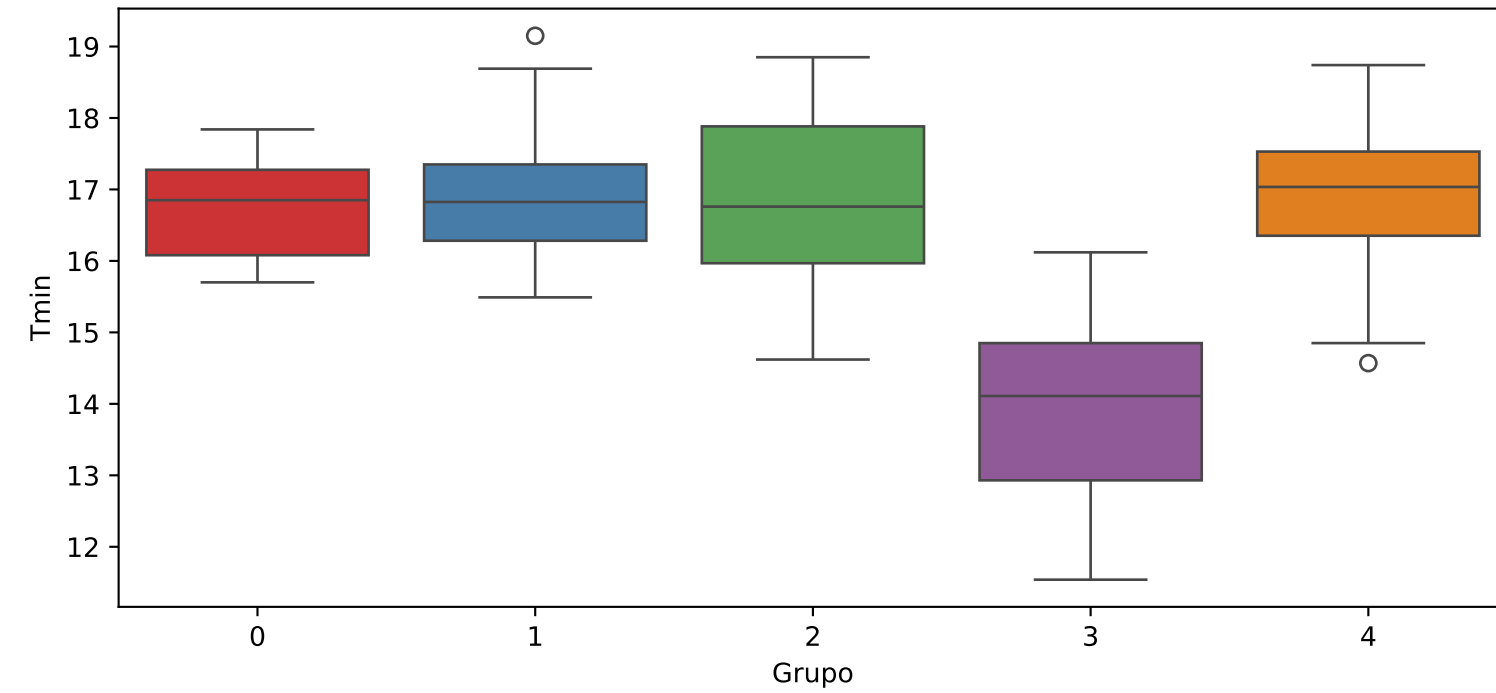


# Boxplots por grupo — Zapopan (2022)

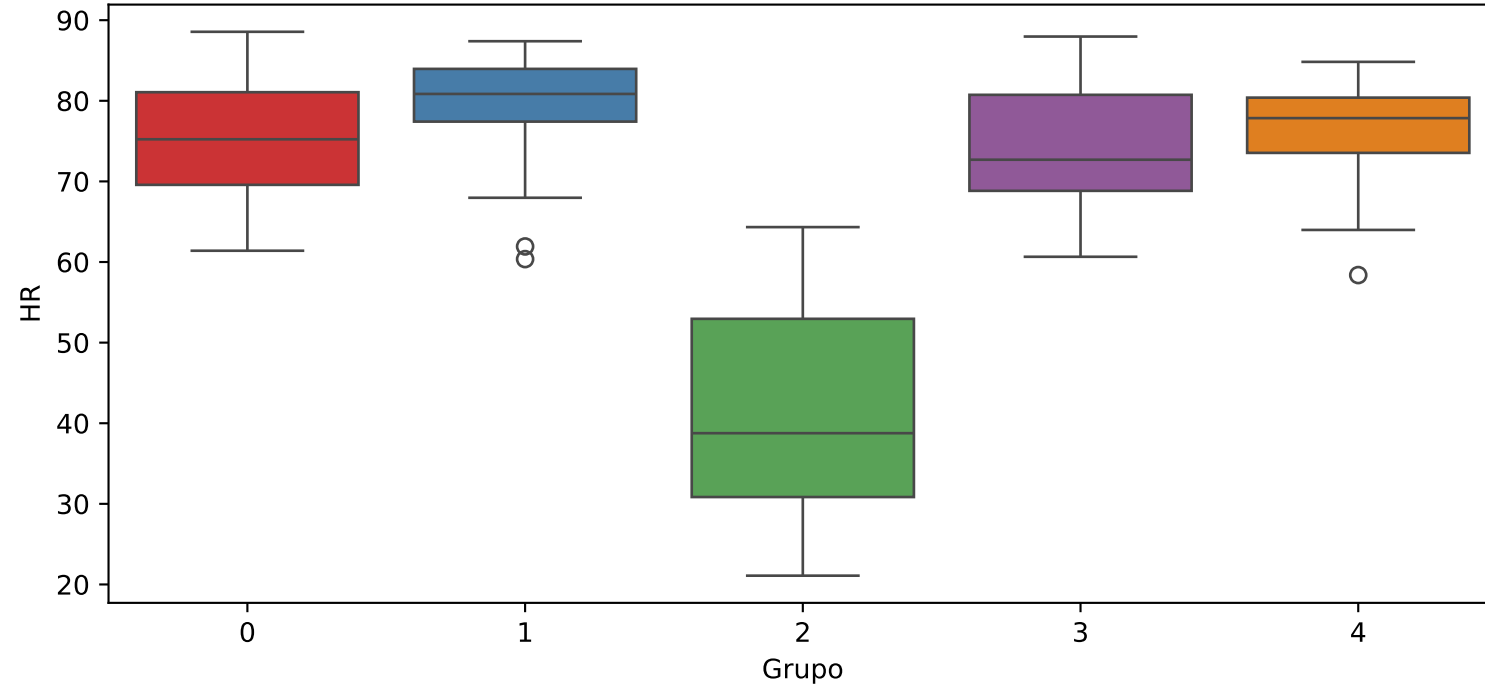
## Distribución de Tmax por grupo



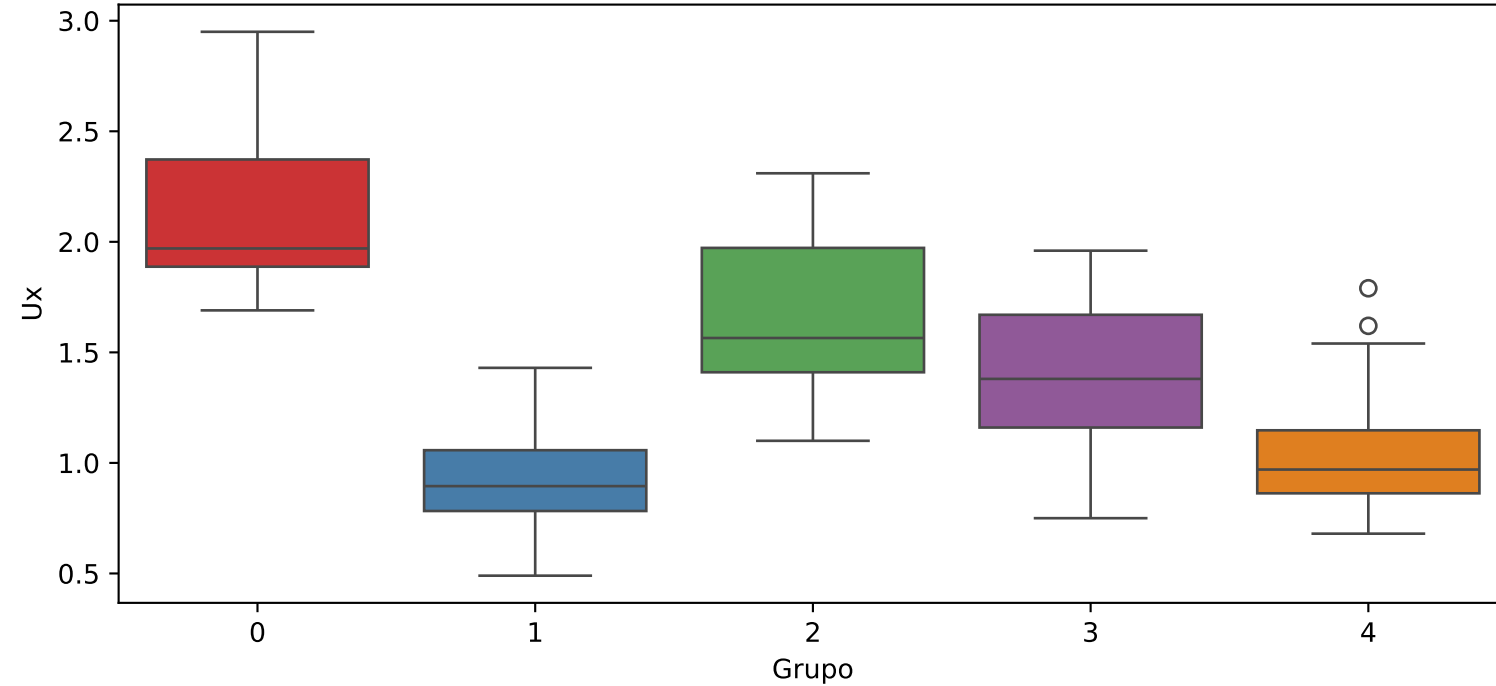
## Distribución de Tmin por grupo



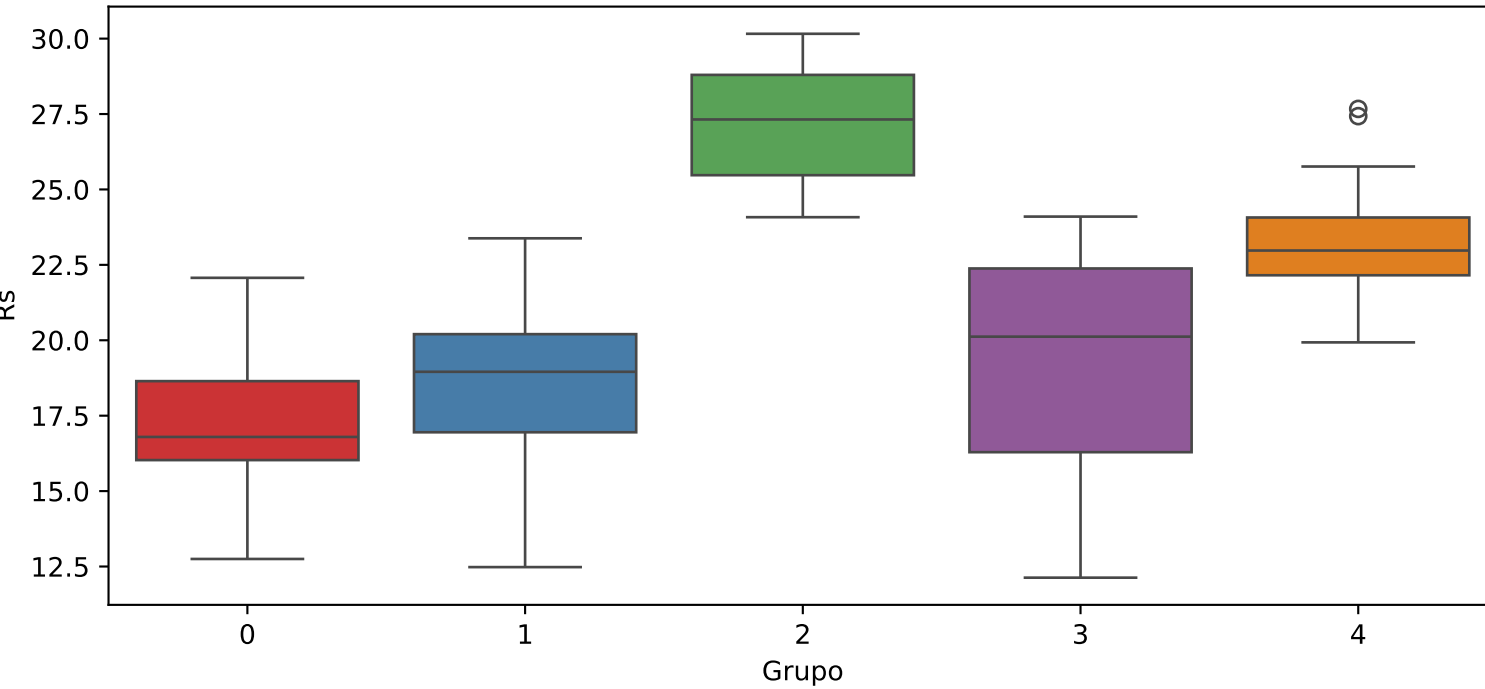
## Distribución de HR por grupo



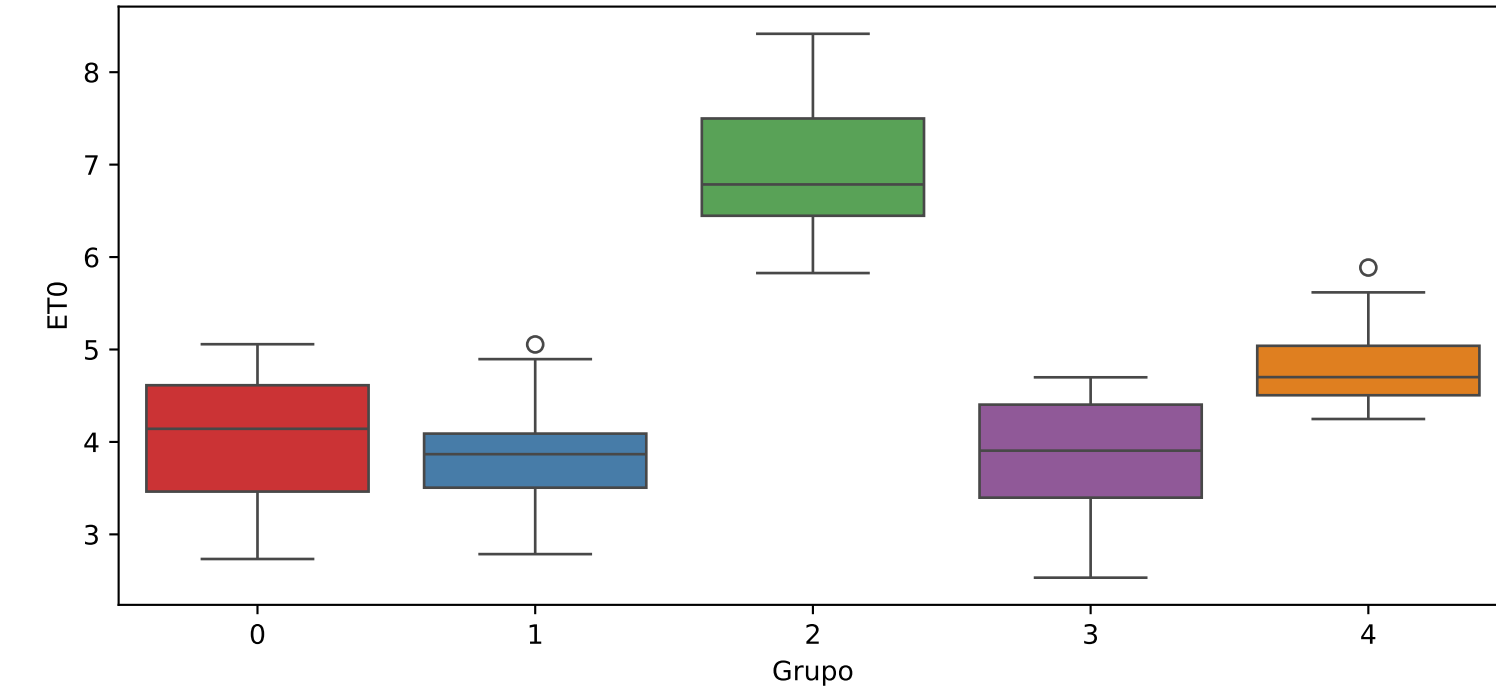
## Distribución de Ux por grupo



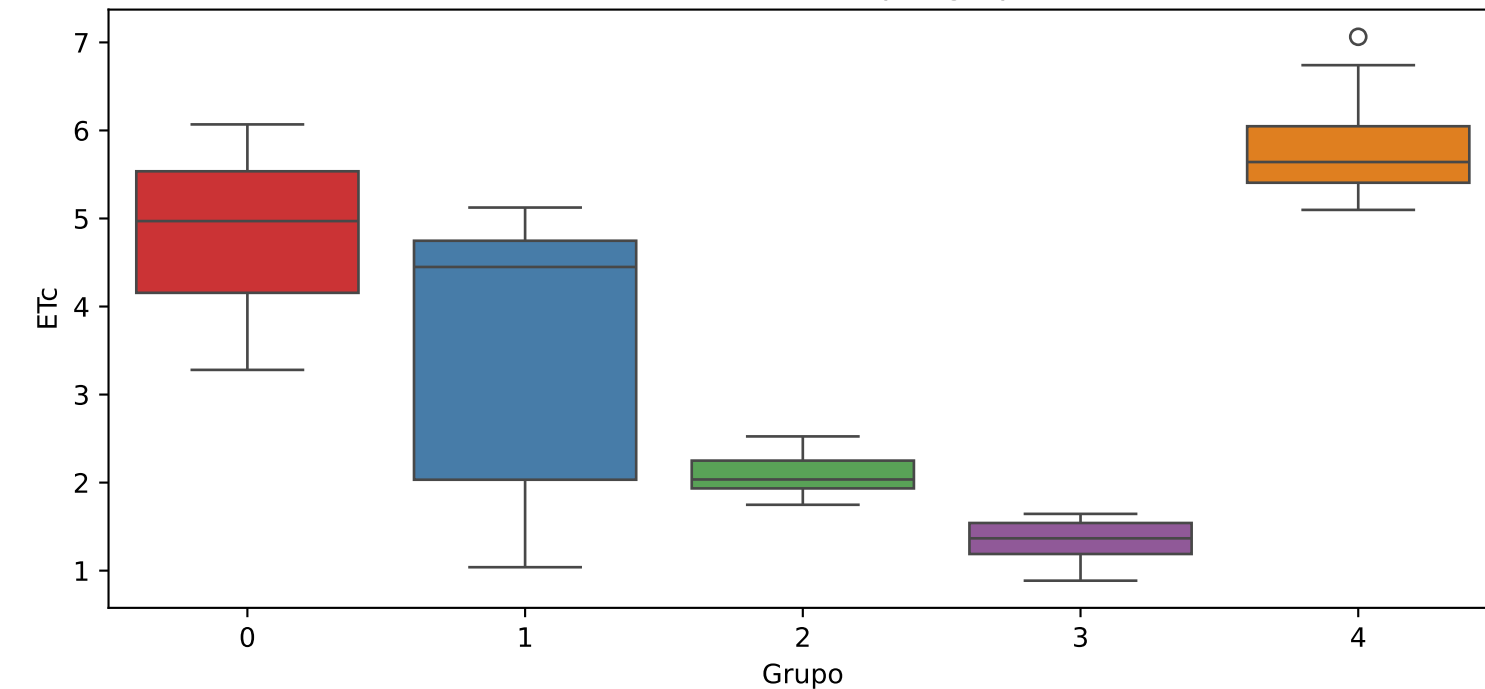
## Distribución de Rs por grupo



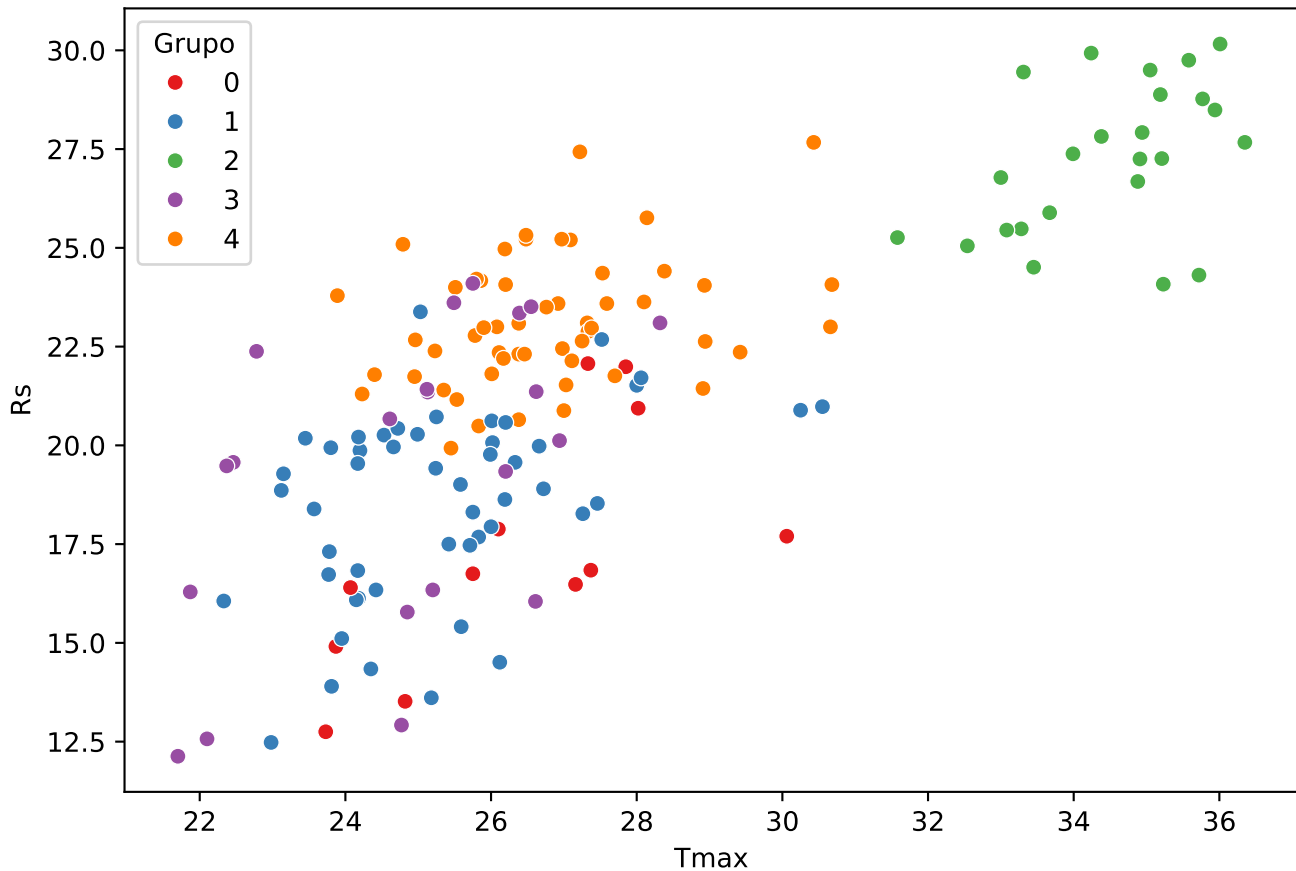
## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2022)



## **Zapopan — 2023**

Días del ciclo: 161

ETc total [mm]: 730.4

ETverde total [mm]: 258.2

ETazul total [mm]: 472.2

Tmax / Tmin [°C]: 39.0 / 12.9

**Zapopan — 2023 · Resultados y métricas**

[Zapopan 2023] Regresión Lineal ET0 — R²: 0.9942 MSE: 0.0148

[Zapopan 2023] Random Forest ET0 — R²: 0.9872 MSE: 0.0331

Importancias: {'Tmax': 0.5959911985819532, 'Tmin': 0.00608806362752554, 'HR': 0.1132995406577392, 'Ux': 0.006045180216250782, 'Rs': 0.2785760169165313}

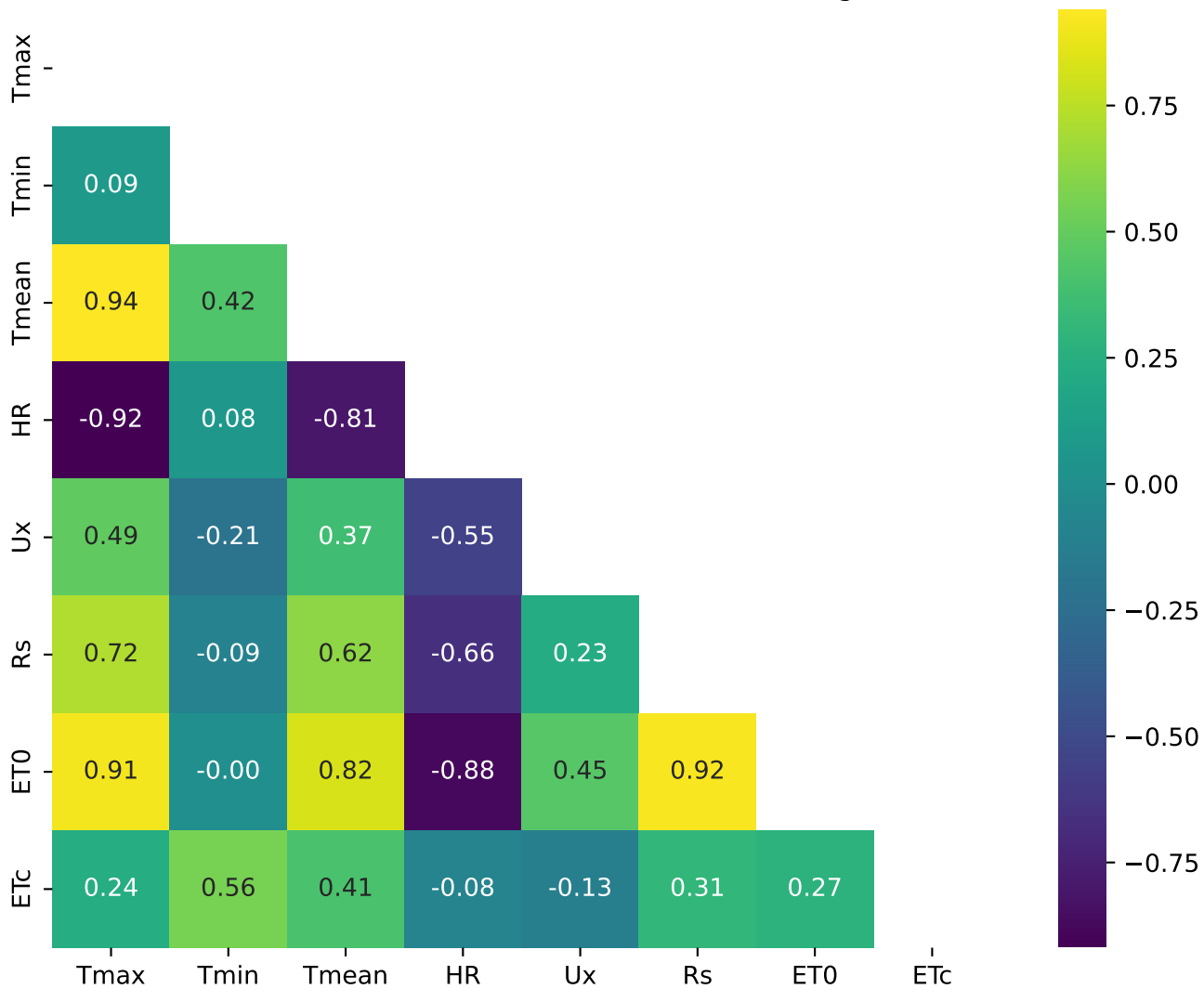
Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	36.831875	19.371250	42.506875	1.555625	26.581250	7.054707	8.465648
1	26.337317	18.031220	78.901951	0.864146	19.026585	4.009323	3.767838
2	34.562857	15.941786	43.474286	1.719286	28.880000	7.204826	2.171432
3	26.153889	15.900556	75.317778	1.531111	15.224444	3.363445	1.336360
4	29.107931	17.896724	70.284828	1.188621	23.716379	5.170769	6.130859

**Zapopan — 2023**

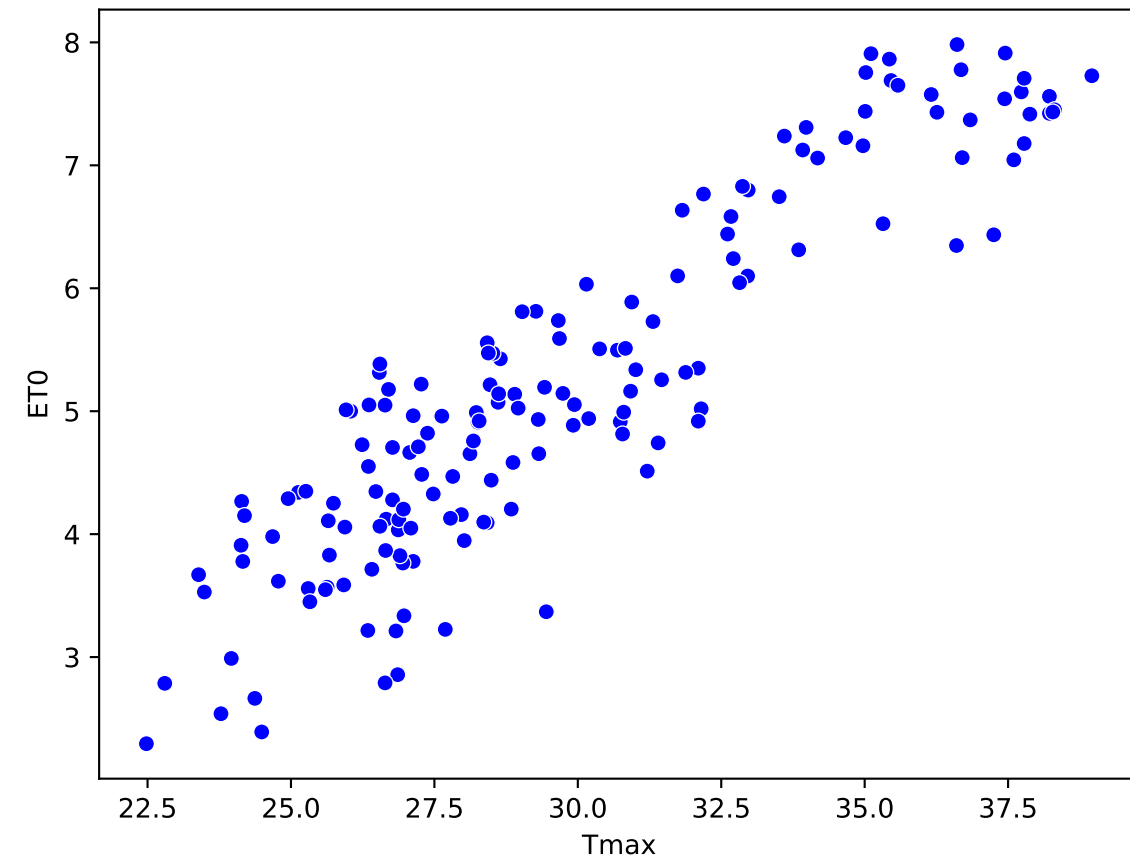


Matriz de Correlación entre Variables Meteorológicas

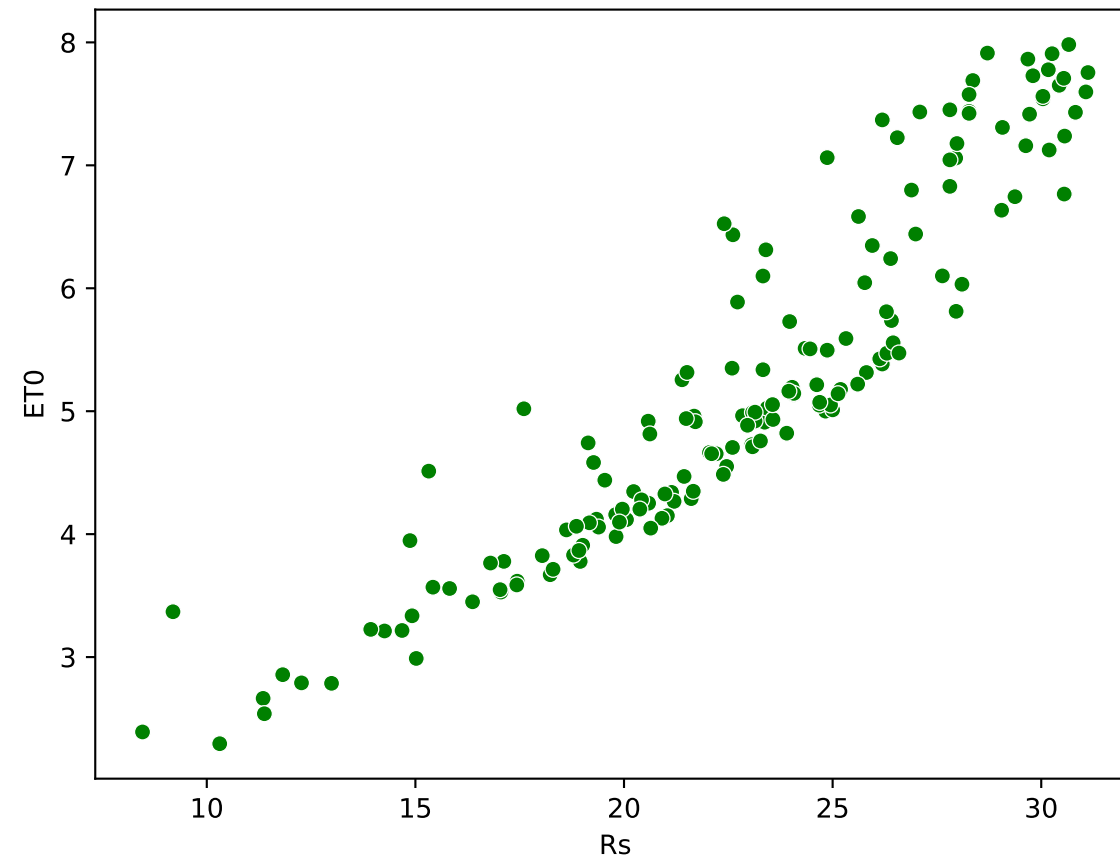


# Dispersión — Zapopan (2023)

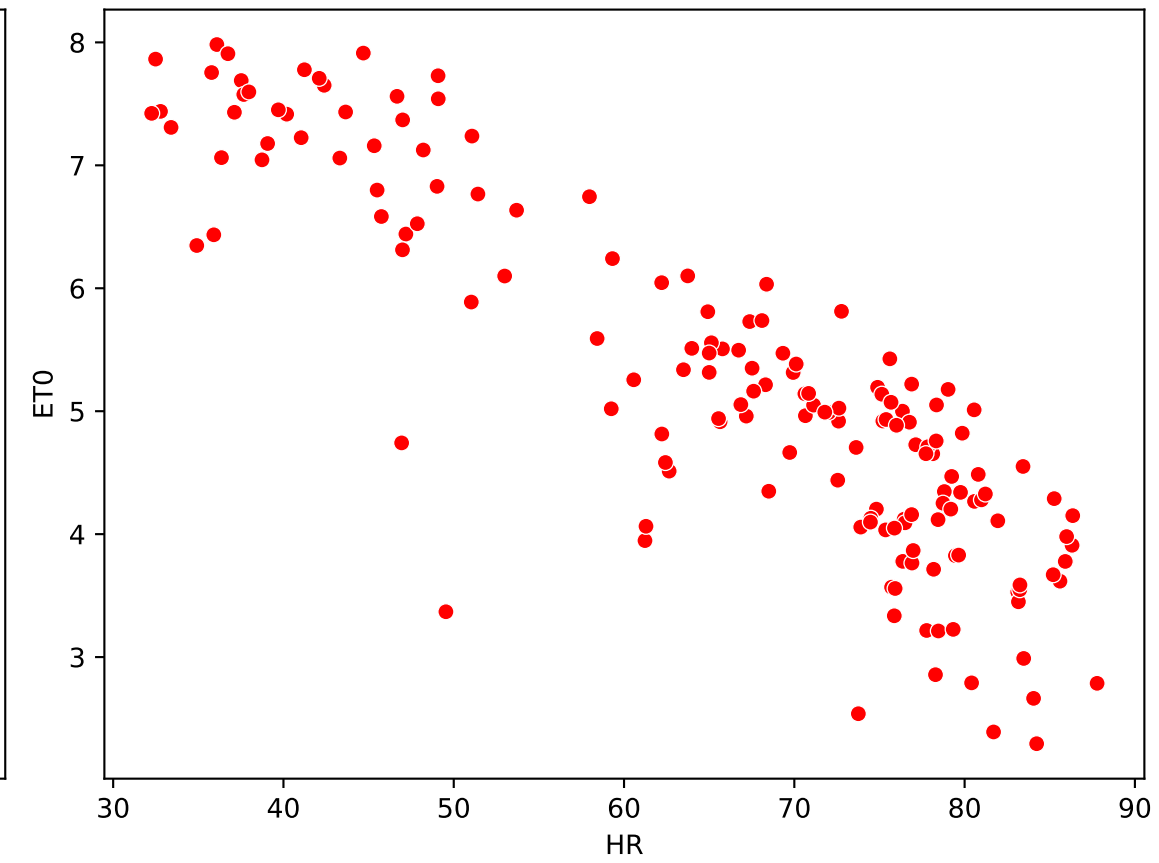
## Tmax vs ET0



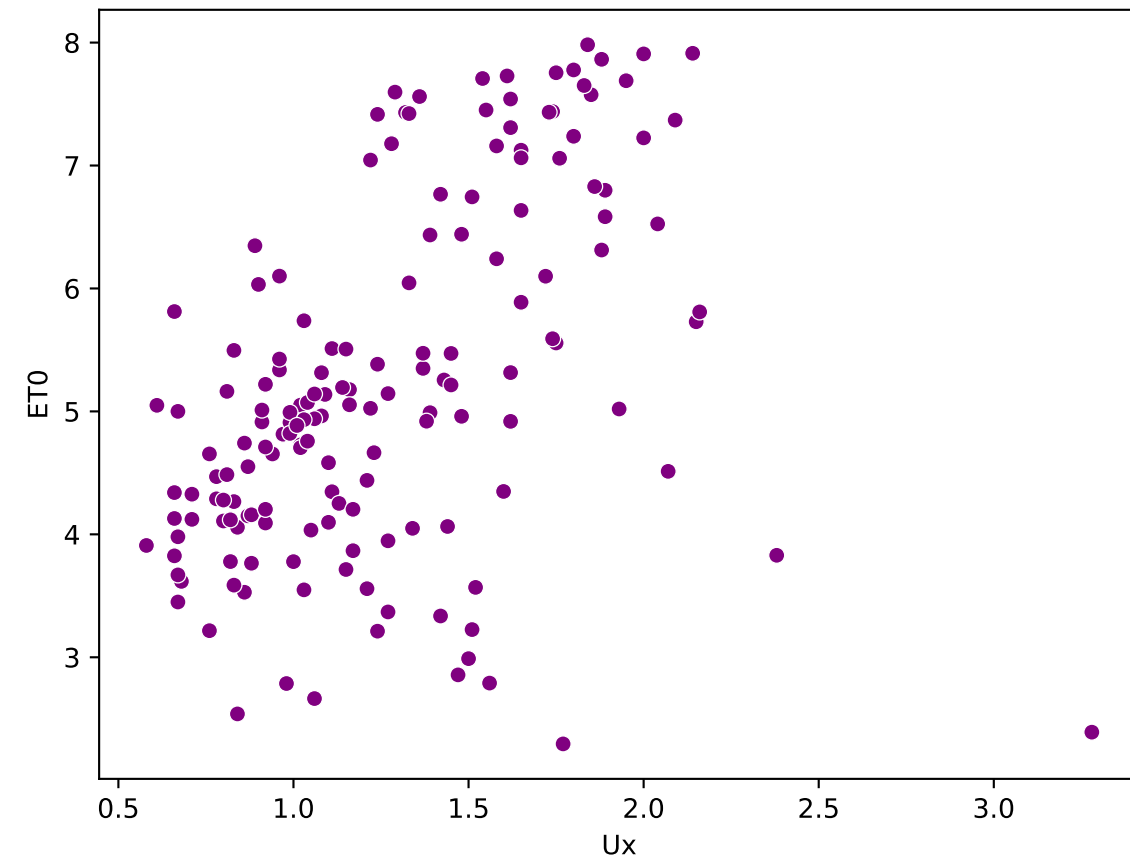
## Rs vs ET0



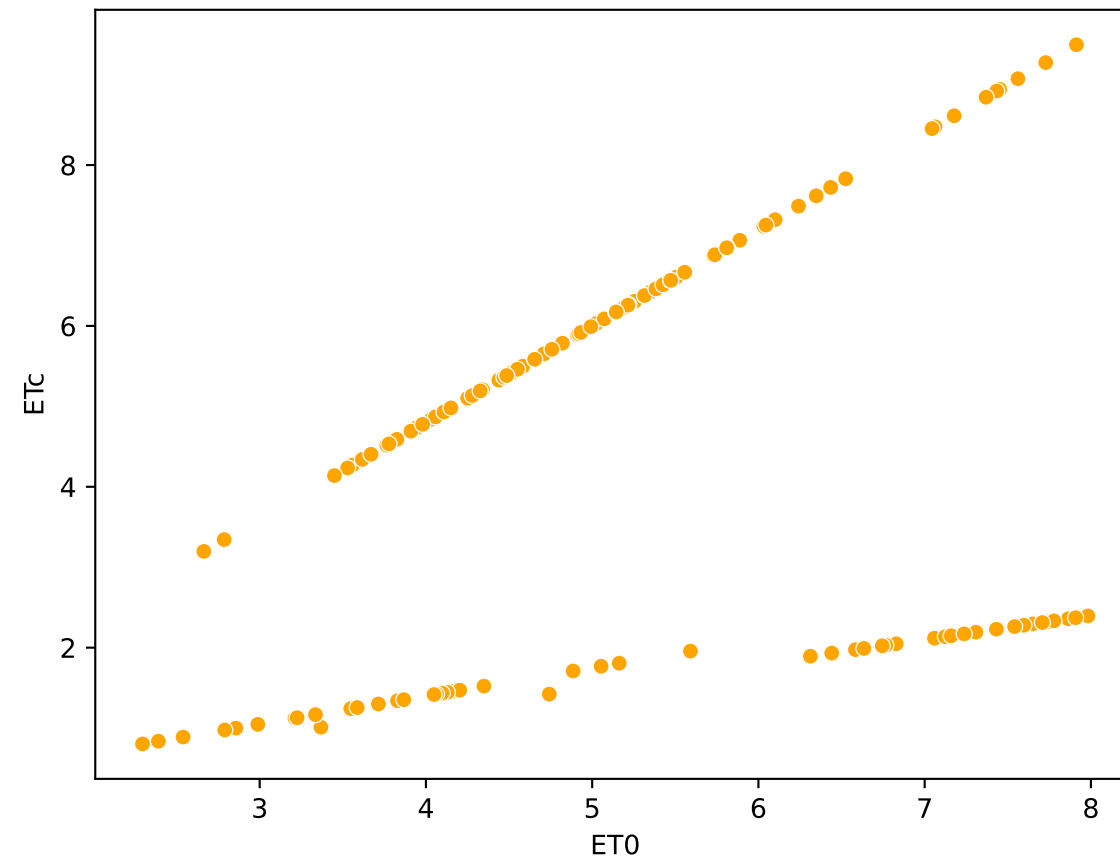
## HR vs ET0



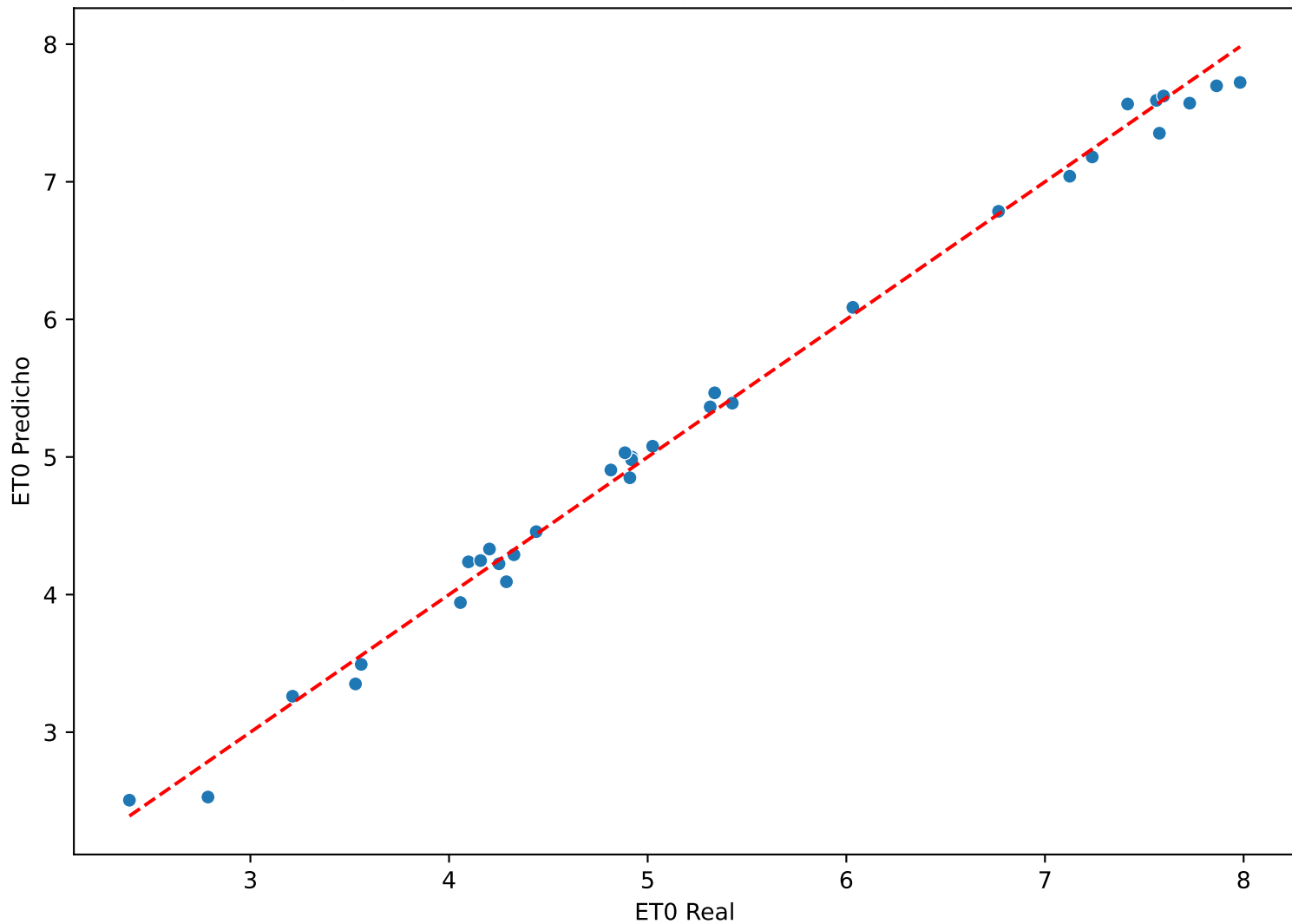
## Ux vs ET0



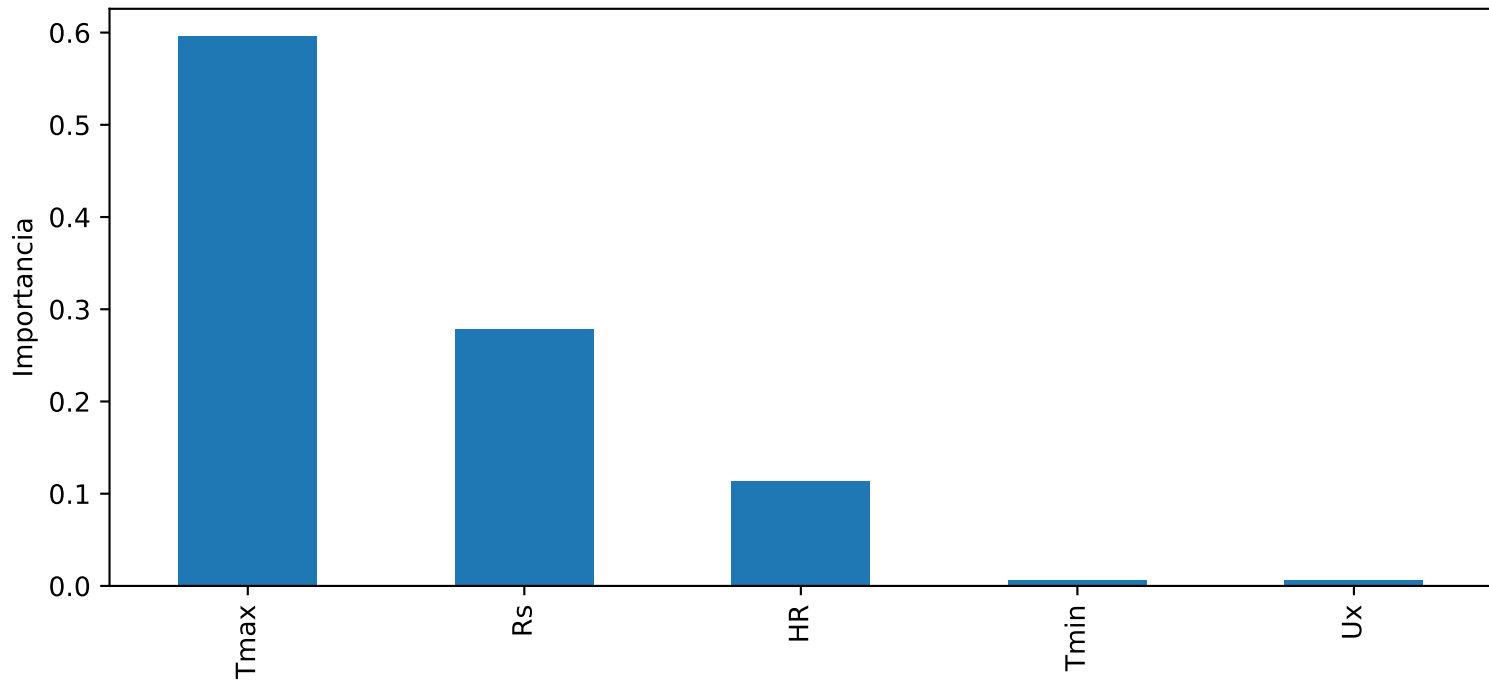
## ET0 vs ETc



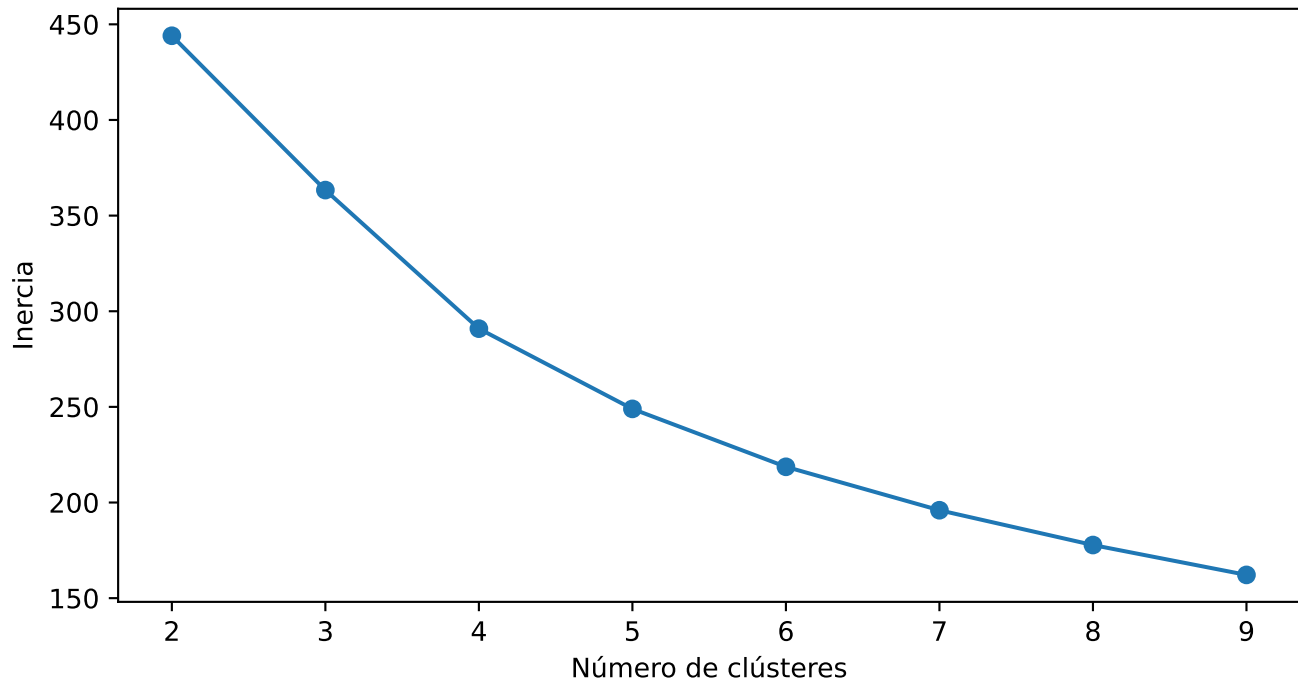
Comparación entre ET0 Real y Predicho — Zapopan (2023)



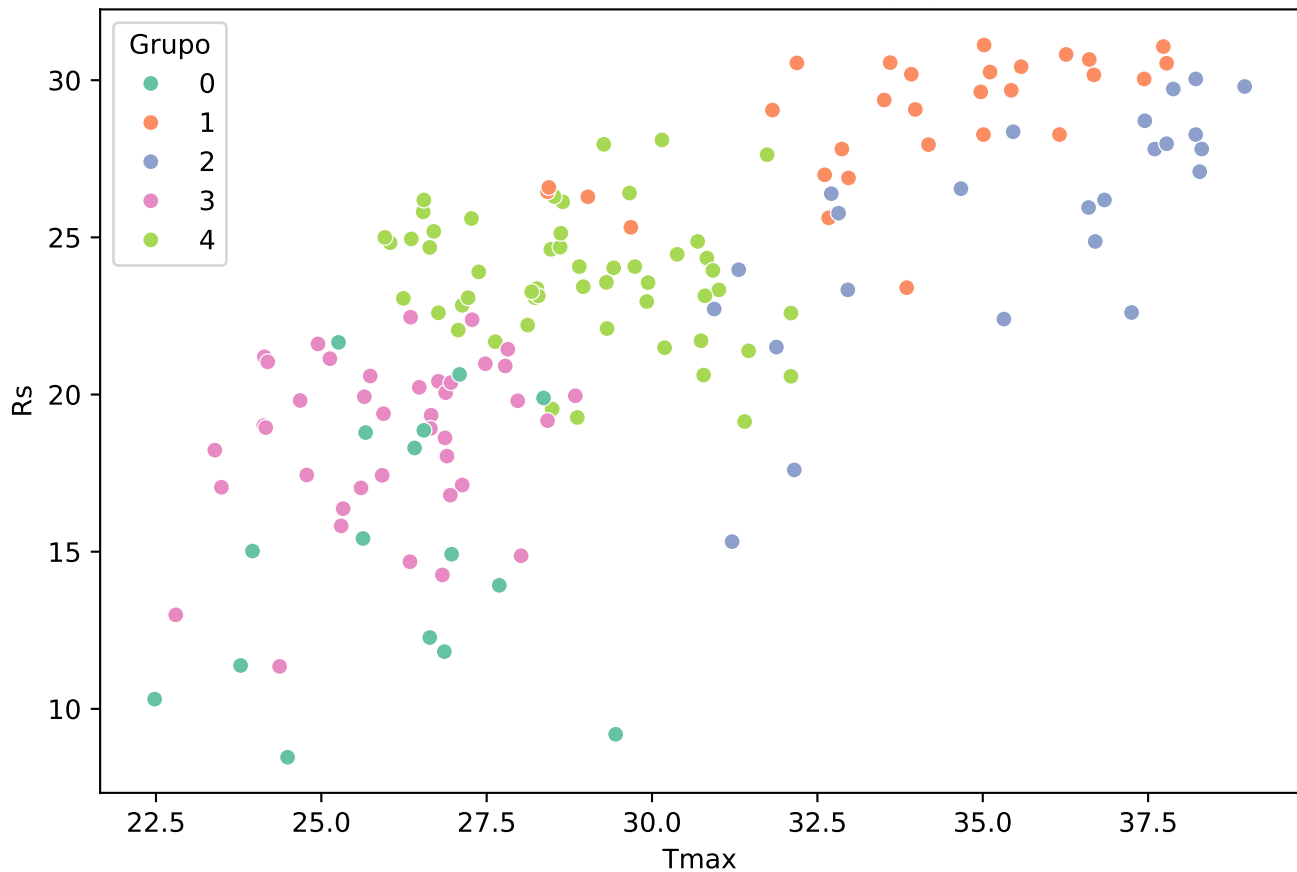
Importancia de variables (RF) — Zapopan (2023)



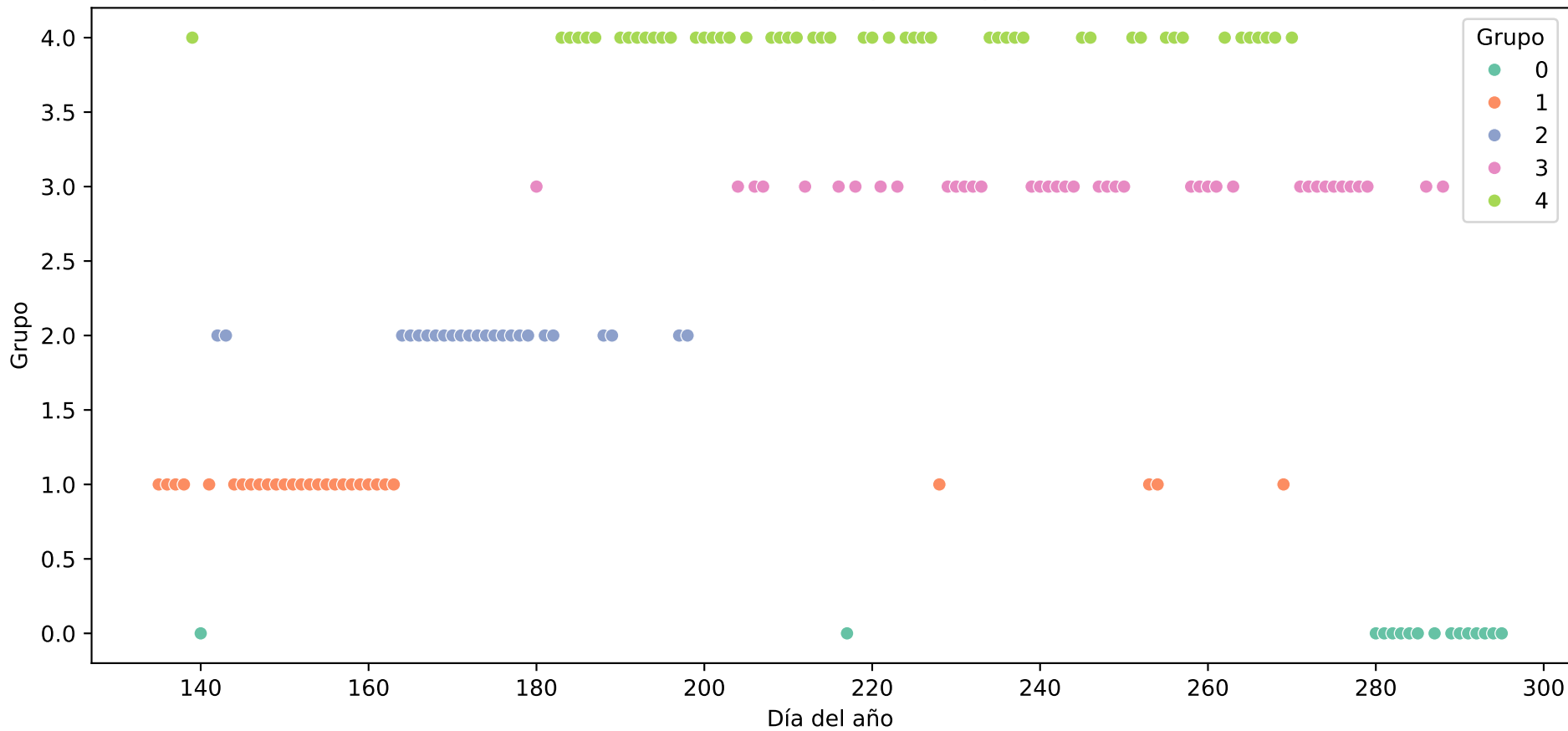
Método del codo



Clasificación de días climáticos — Zapopan (2023)

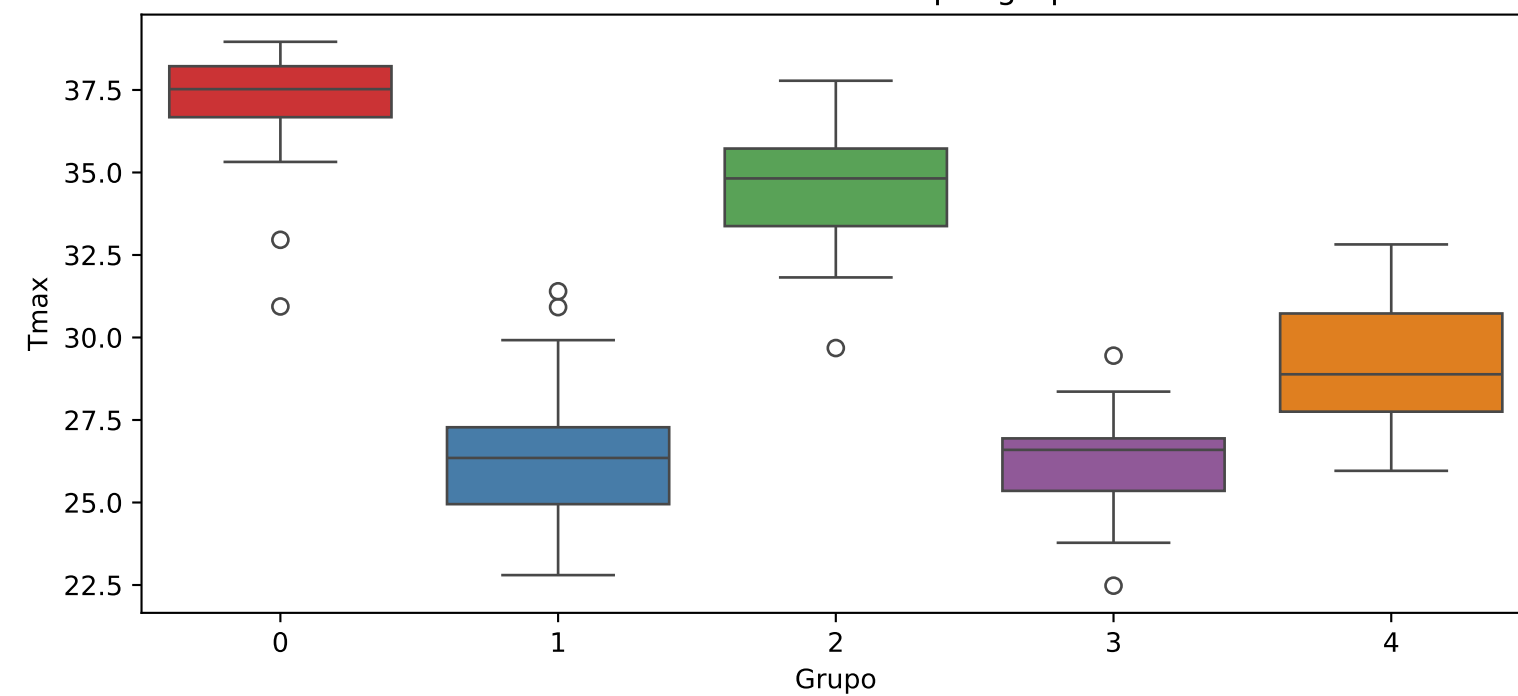


Distribución de días por grupo — Zapopan (2023)

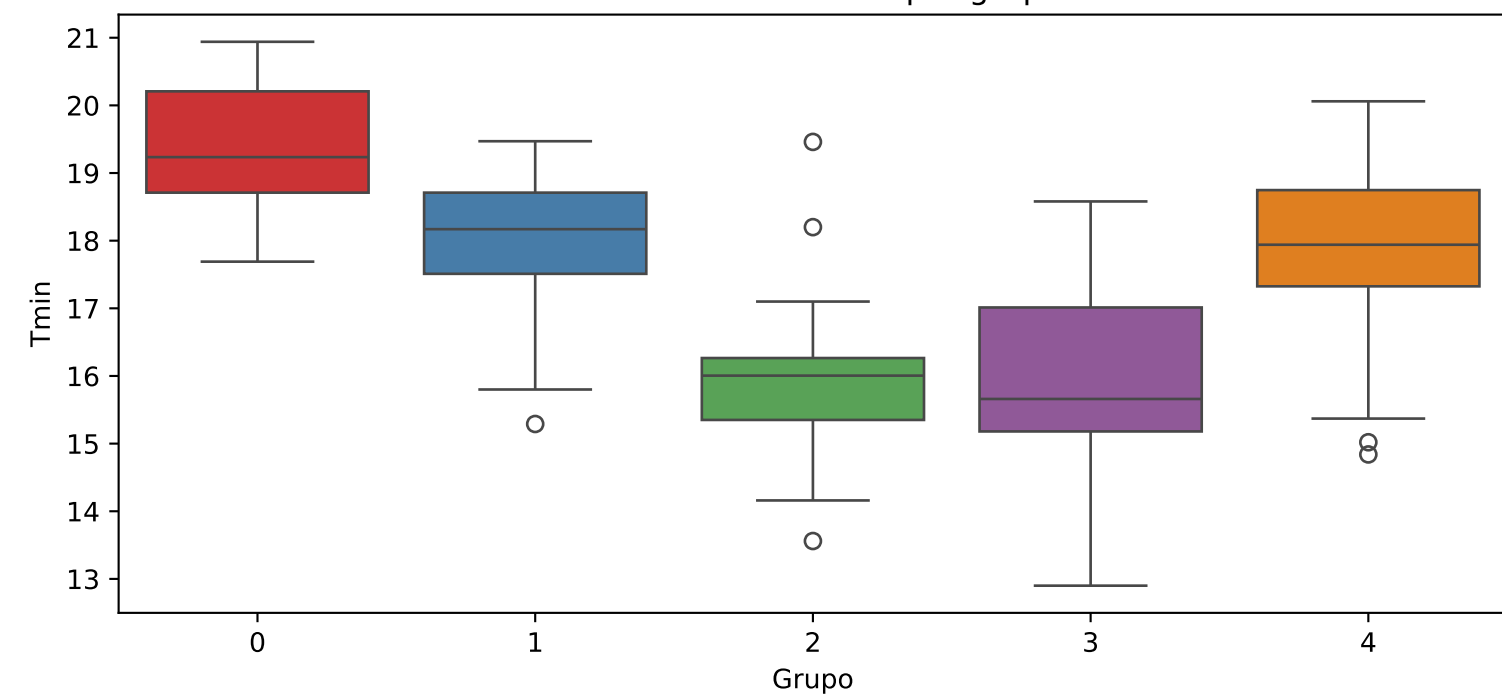


# Boxplots por grupo — Zapopan (2023)

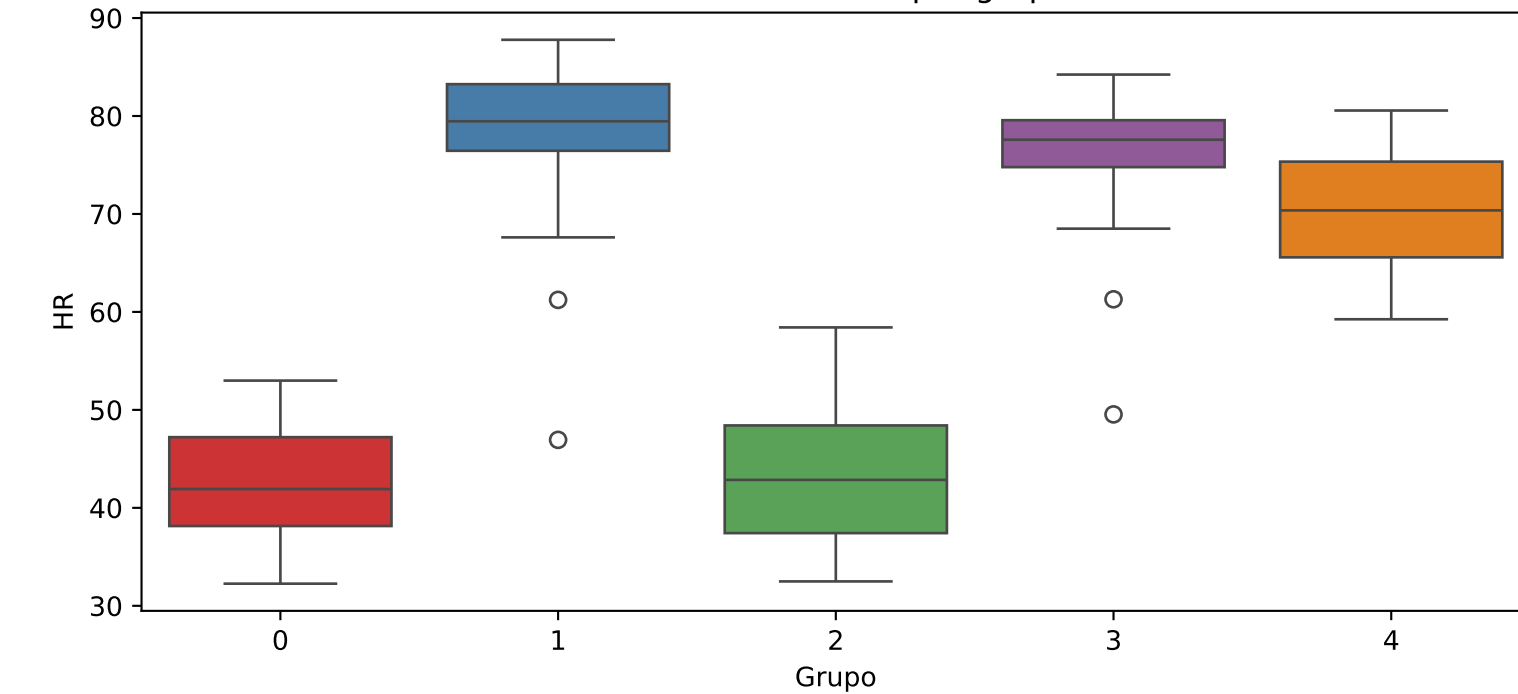
## Distribución de Tmax por grupo



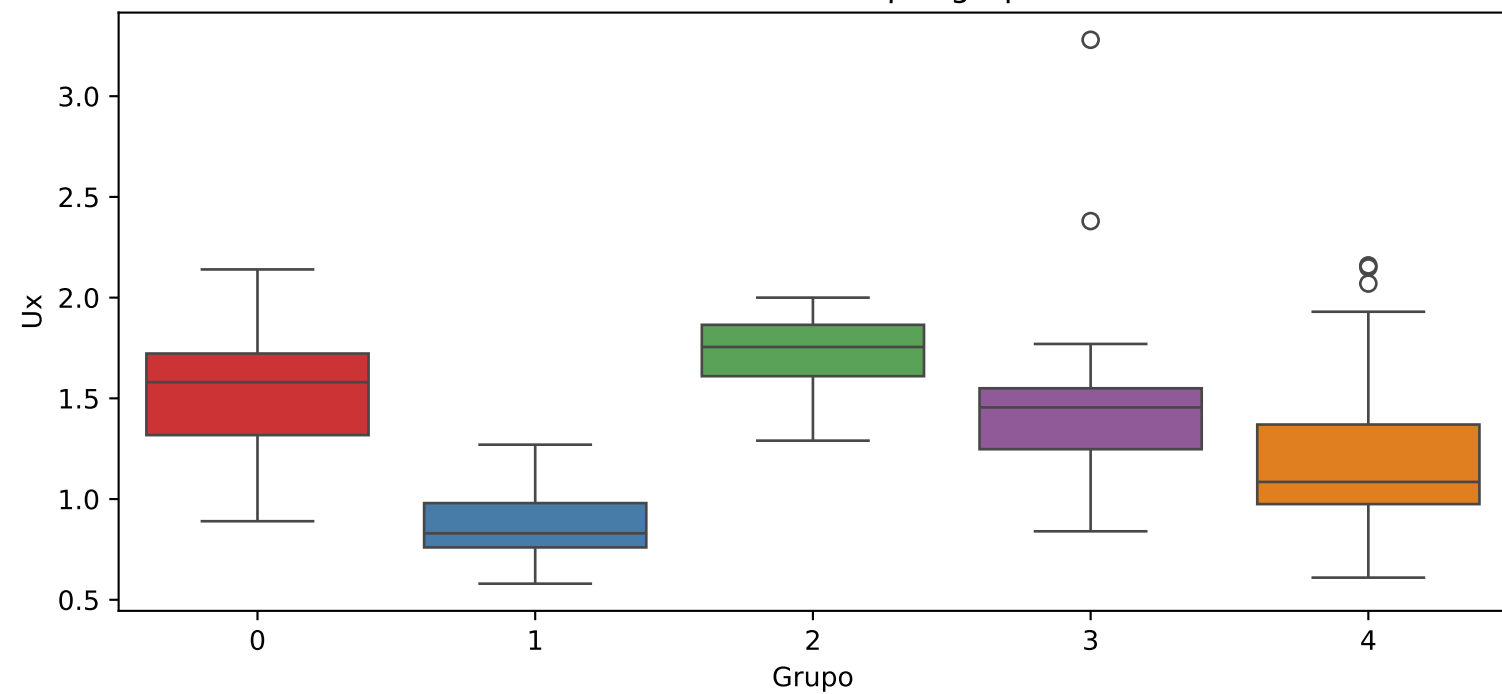
## Distribución de Tmin por grupo



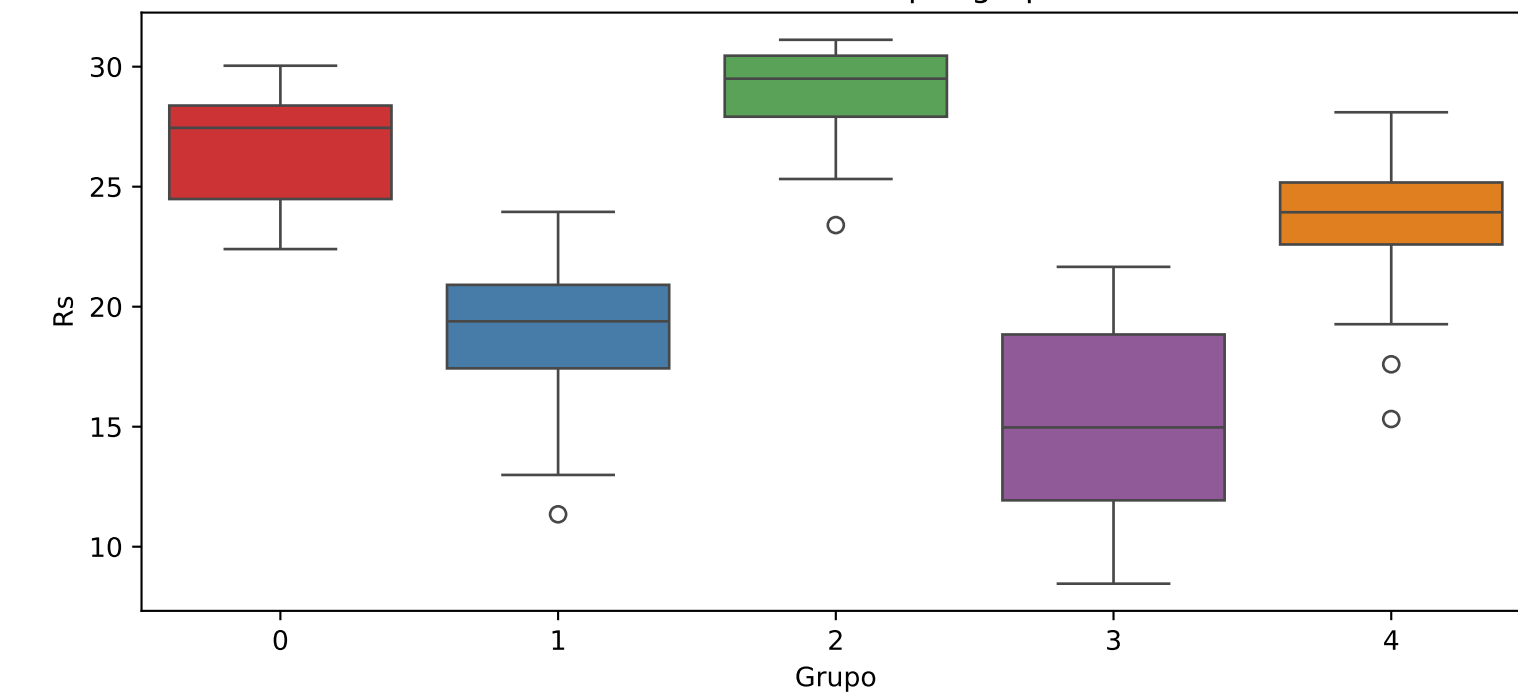
## Distribución de HR por grupo



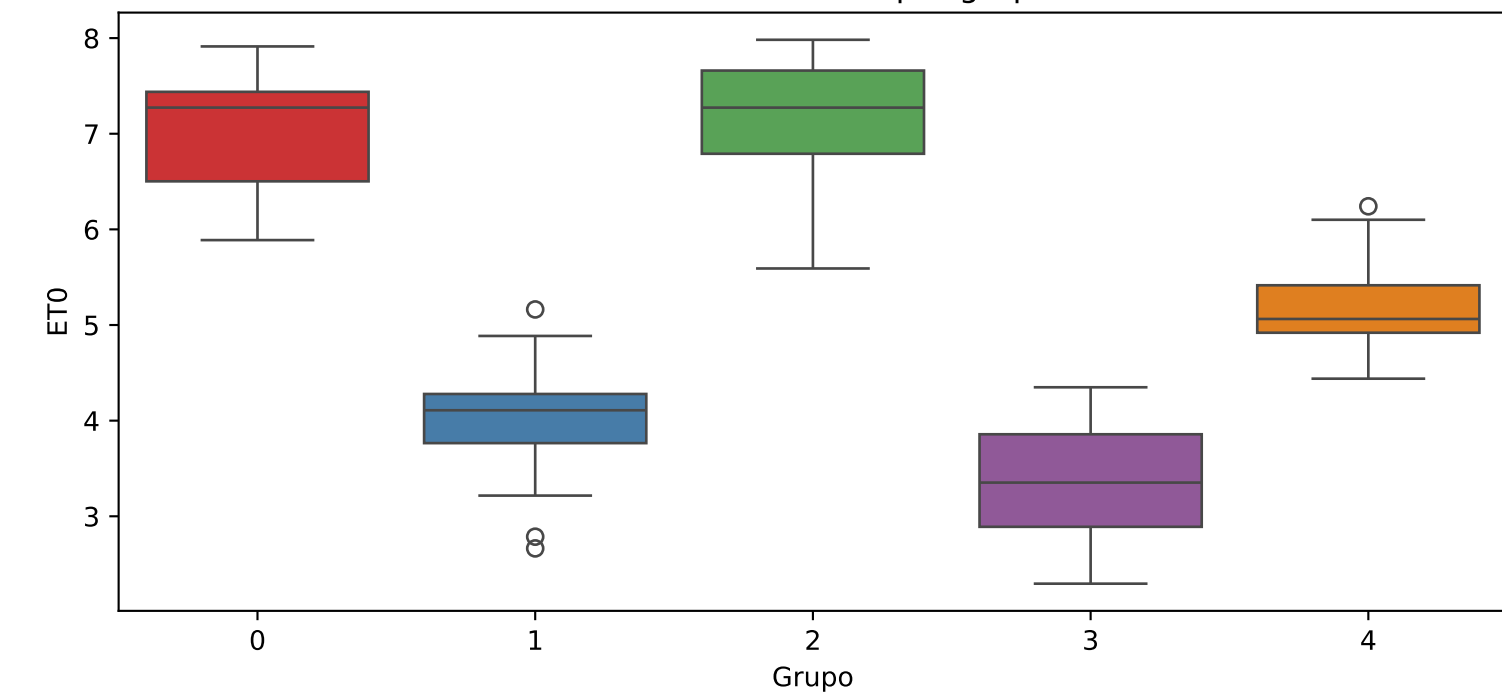
## Distribución de Ux por grupo



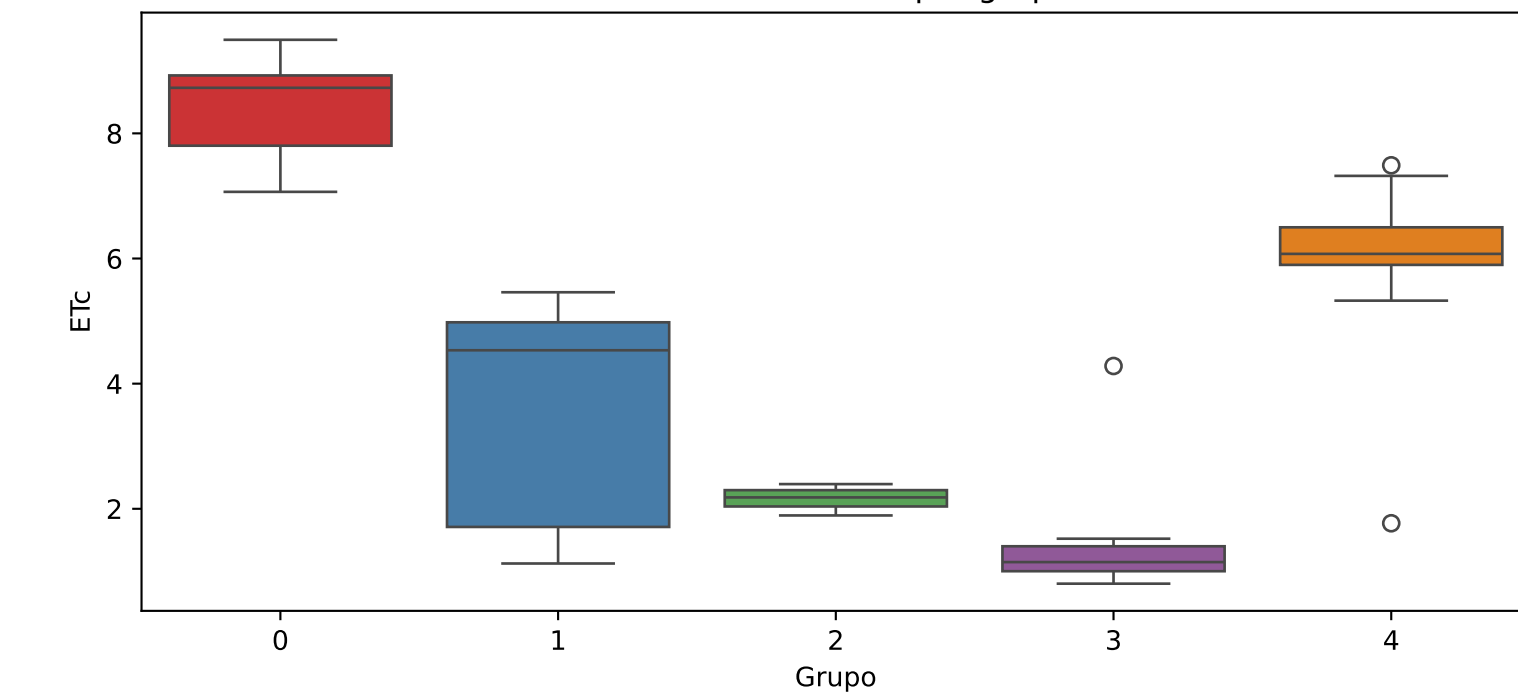
## Distribución de Rs por grupo



## Distribución de ET0 por grupo

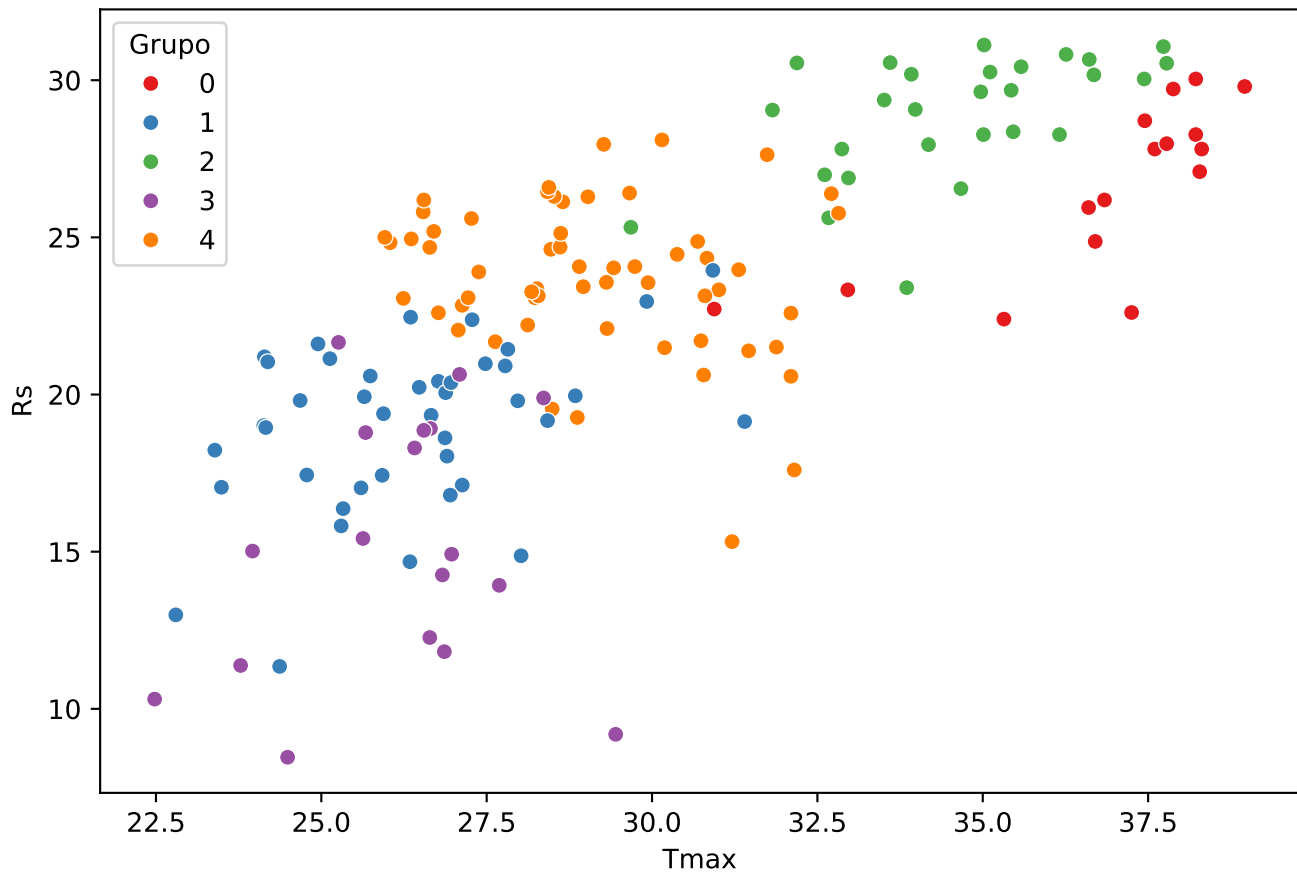


## Distribución de ETc por grupo





Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2023)



## **Zapopan — 2024**

Días del ciclo: 161

ETc total [mm]: 670.6

ETverde total [mm]: 315.7

ETazul total [mm]: 354.9

Tmax / Tmin [°C]: 39.8 / 10.5

Zapopan — 2024 · Resultados y métricas

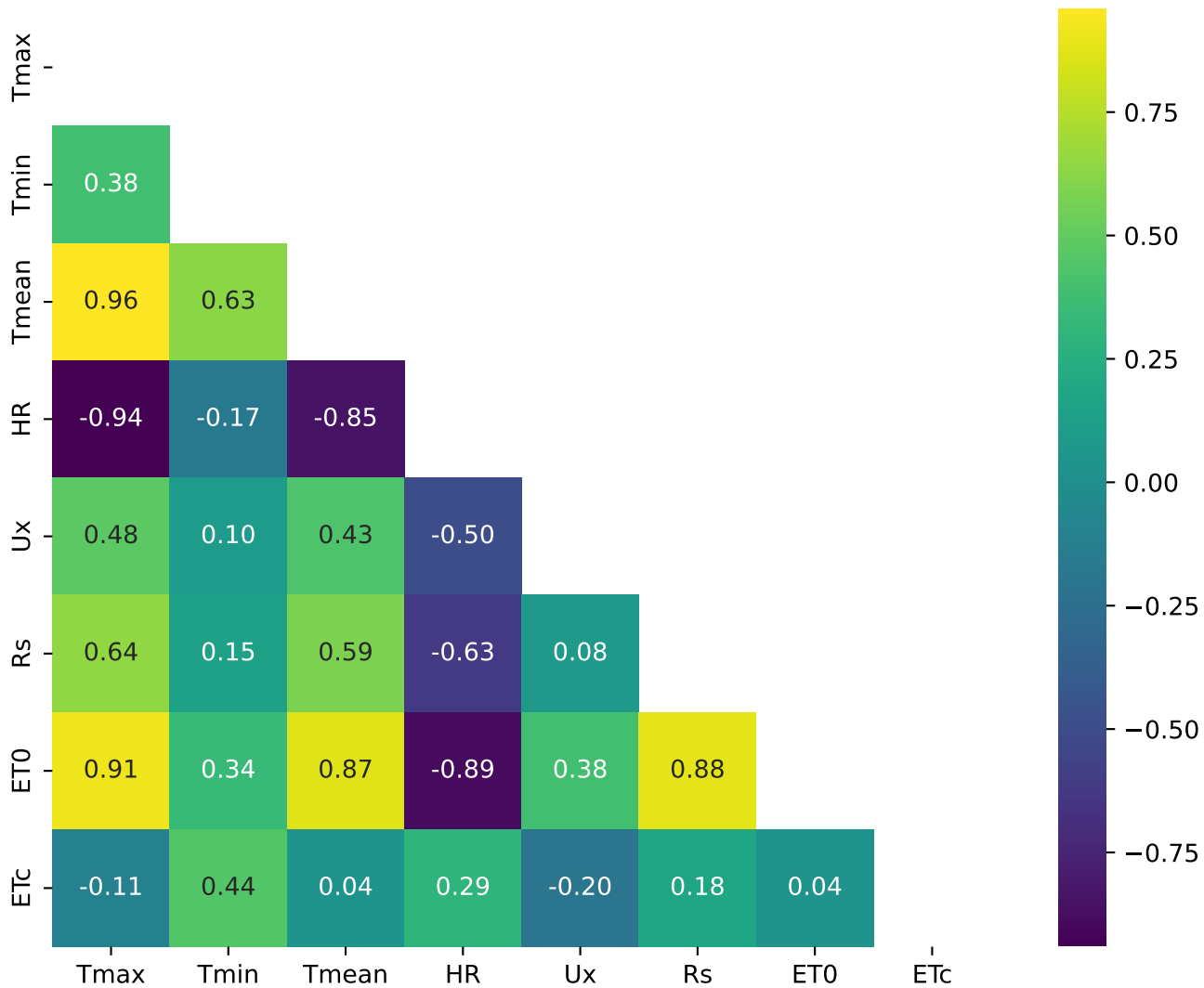
[Zapopan 2024] Regresión Lineal ET0 — R²: 0.9892 MSE: 0.0216  
[Zapopan 2024] Random Forest ET0 — R²: 0.9871 MSE: 0.0257  
Importancias: {'Tmax': 0.6148767619775637, 'Tmin': 0.003652614037285648, 'HR': 0.15489867976404212, 'Ux': 0.006564500164738222, 'Rs': 0.22000744405637035}

Estadísticas descriptivas por grupo (medias):

	Tmax mean	Tmin mean	HR mean	Ux mean	Rs mean	ET0 mean	ETc mean
cluster							
0	26.511096	17.707260	80.017808	0.967671	22.937123	4.681897	5.618276
1	34.531000	19.604000	56.045000	2.239000	23.447000	6.433081	7.719697
2	37.941034	18.442069	34.107241	1.672414	28.444828	7.723835	2.317150
3	26.241905	14.021429	71.644286	1.471905	21.481429	4.264419	1.653925
4	24.798571	17.494286	83.207500	1.325714	13.567500	3.026581	2.903882

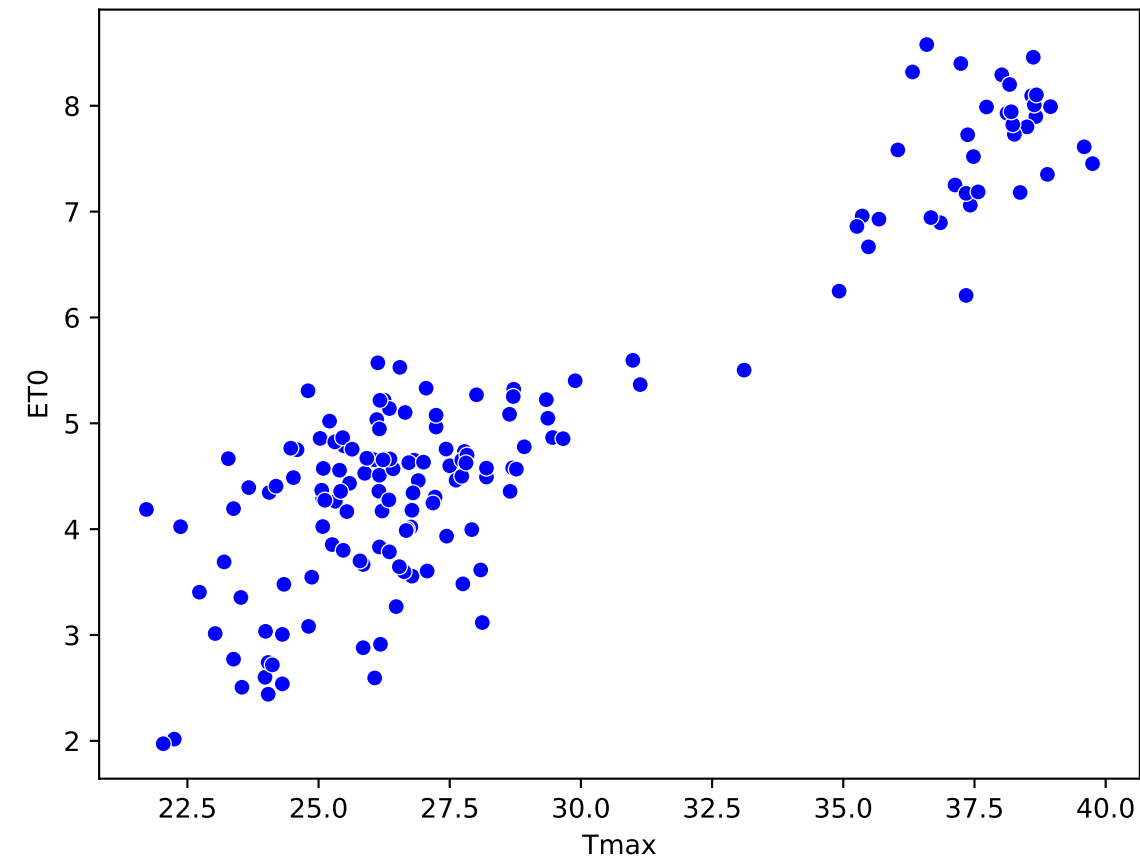
**Zapopan — 2024**

Matriz de Correlación entre Variables Meteorológicas

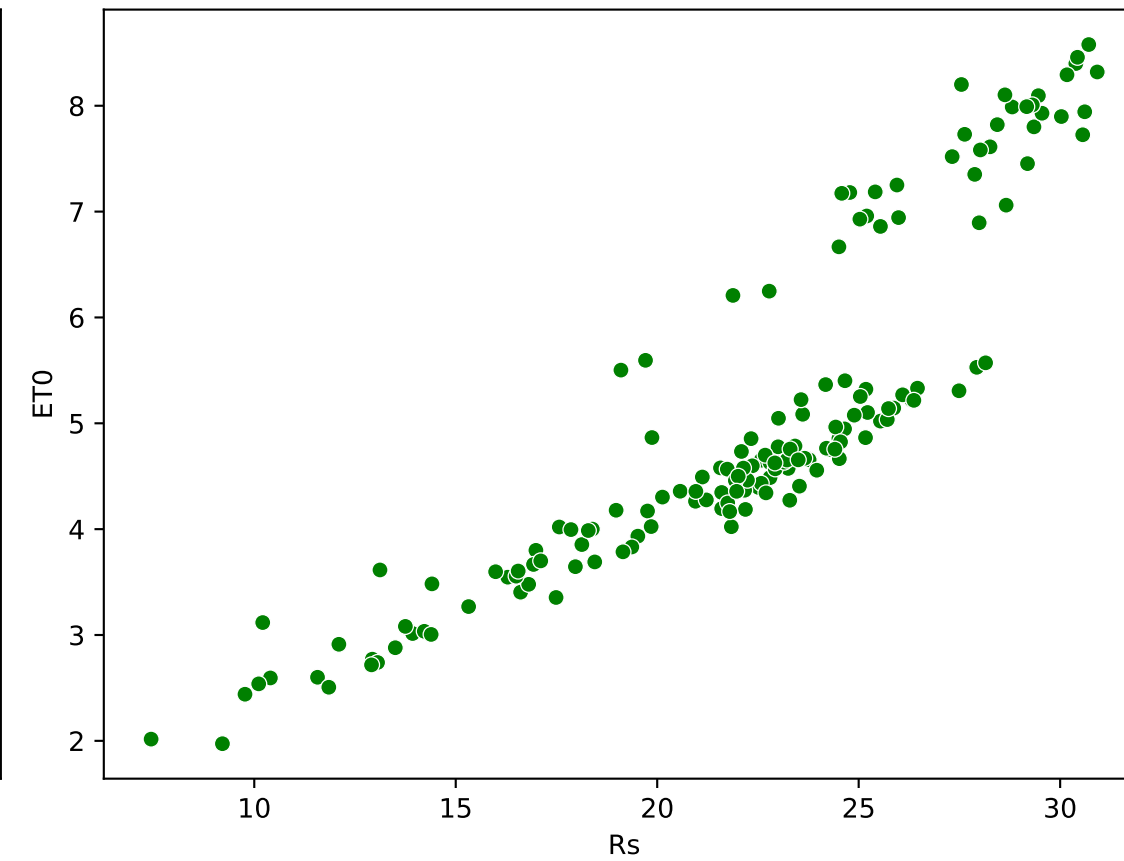


# Dispersión — Zapopan (2024)

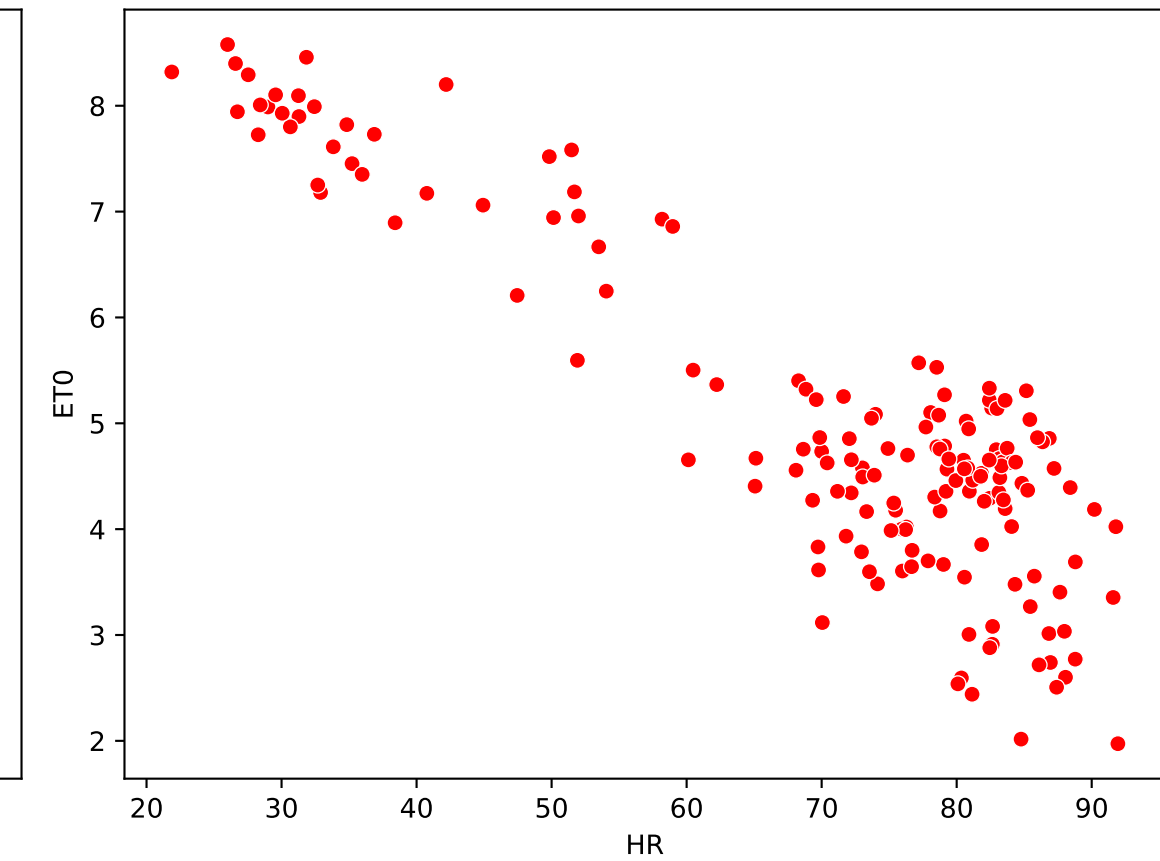
## Tmax vs ET0



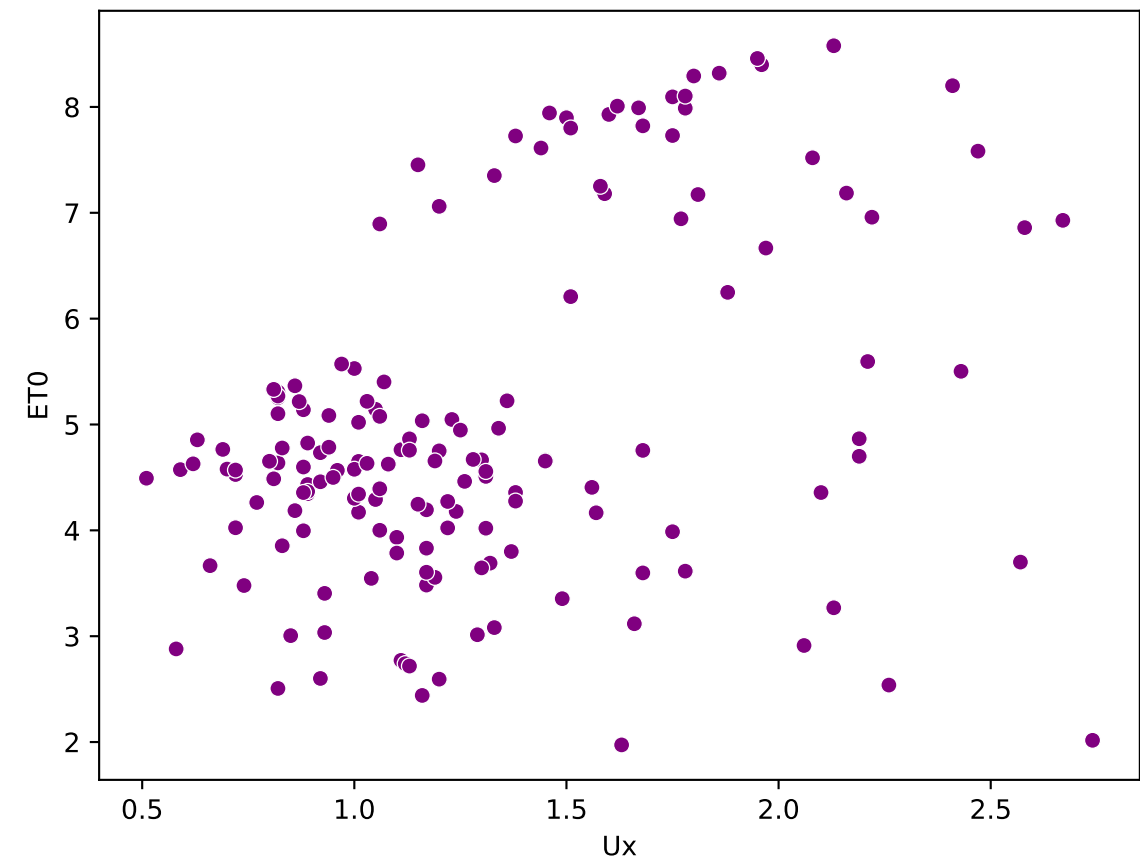
## Rs vs ET0



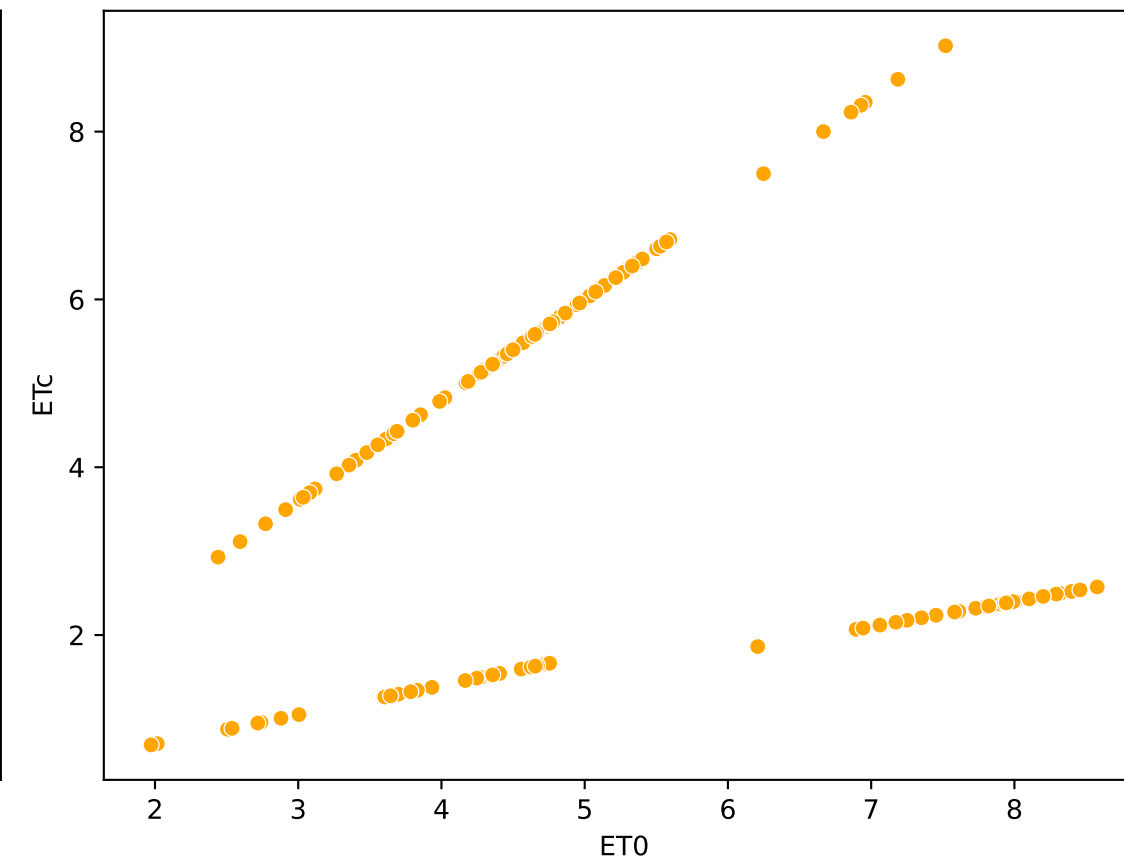
## HR vs ET0



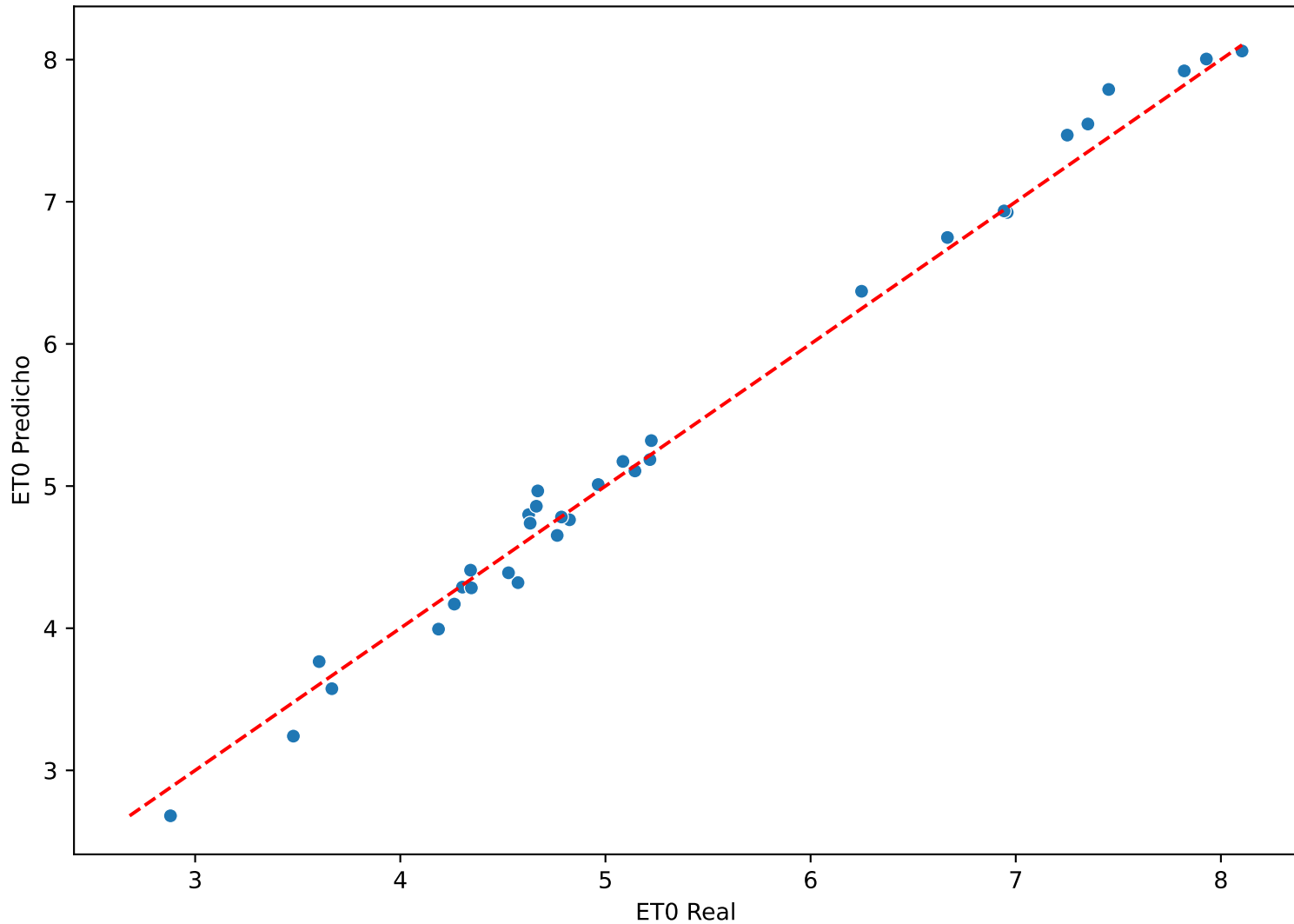
## Ux vs ET0



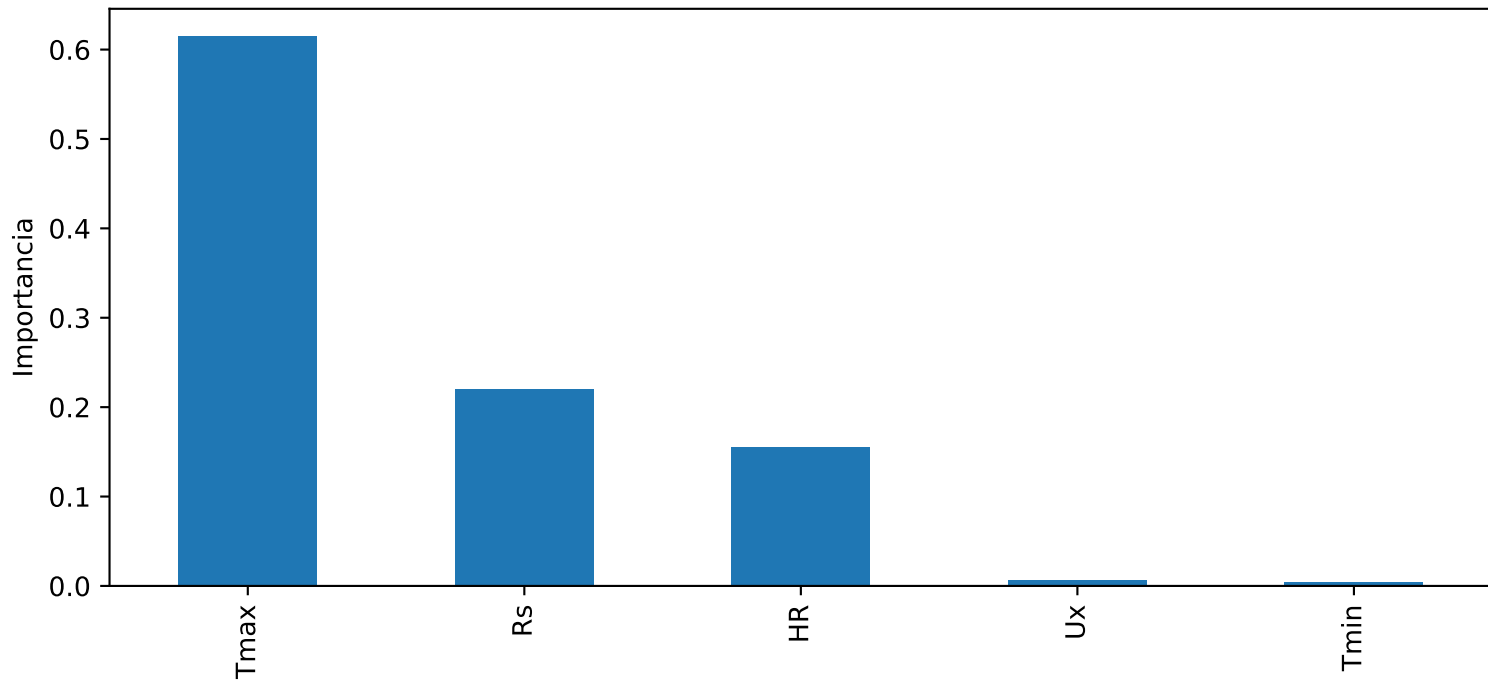
## ET0 vs ETc



Comparación entre ET0 Real y Predicho — Zapopan (2024)

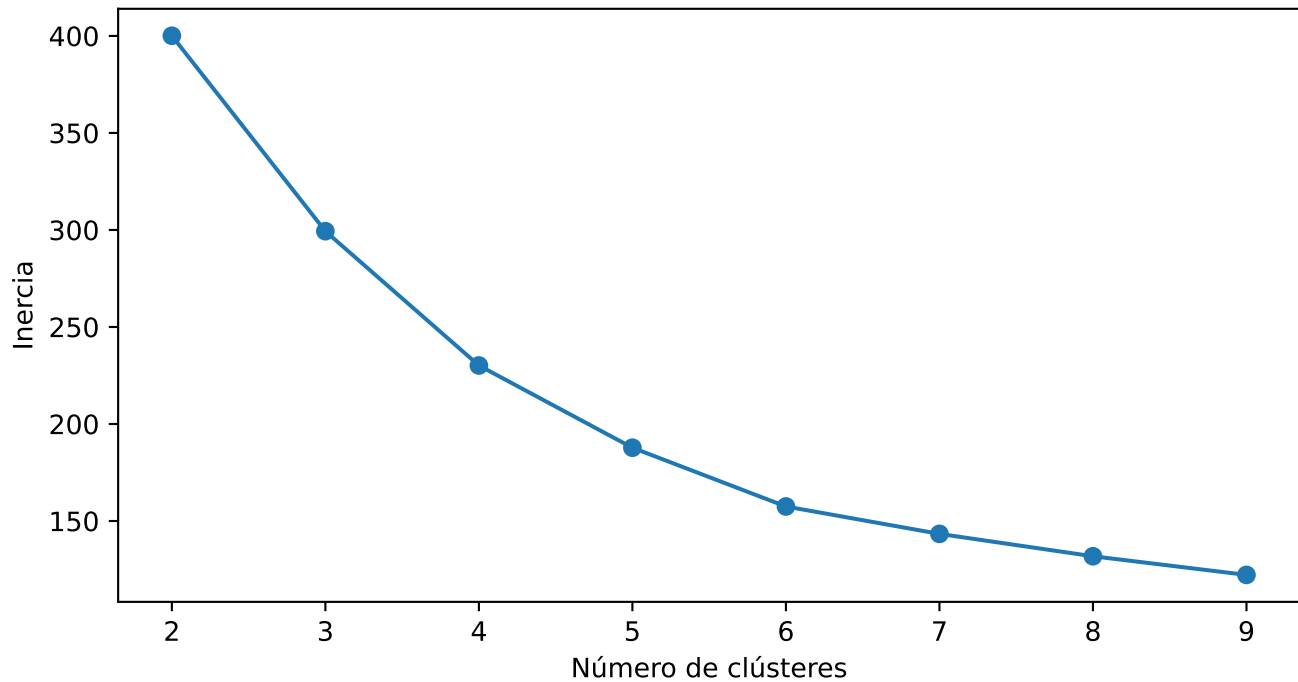


Importancia de variables (RF) — Zapopan (2024)

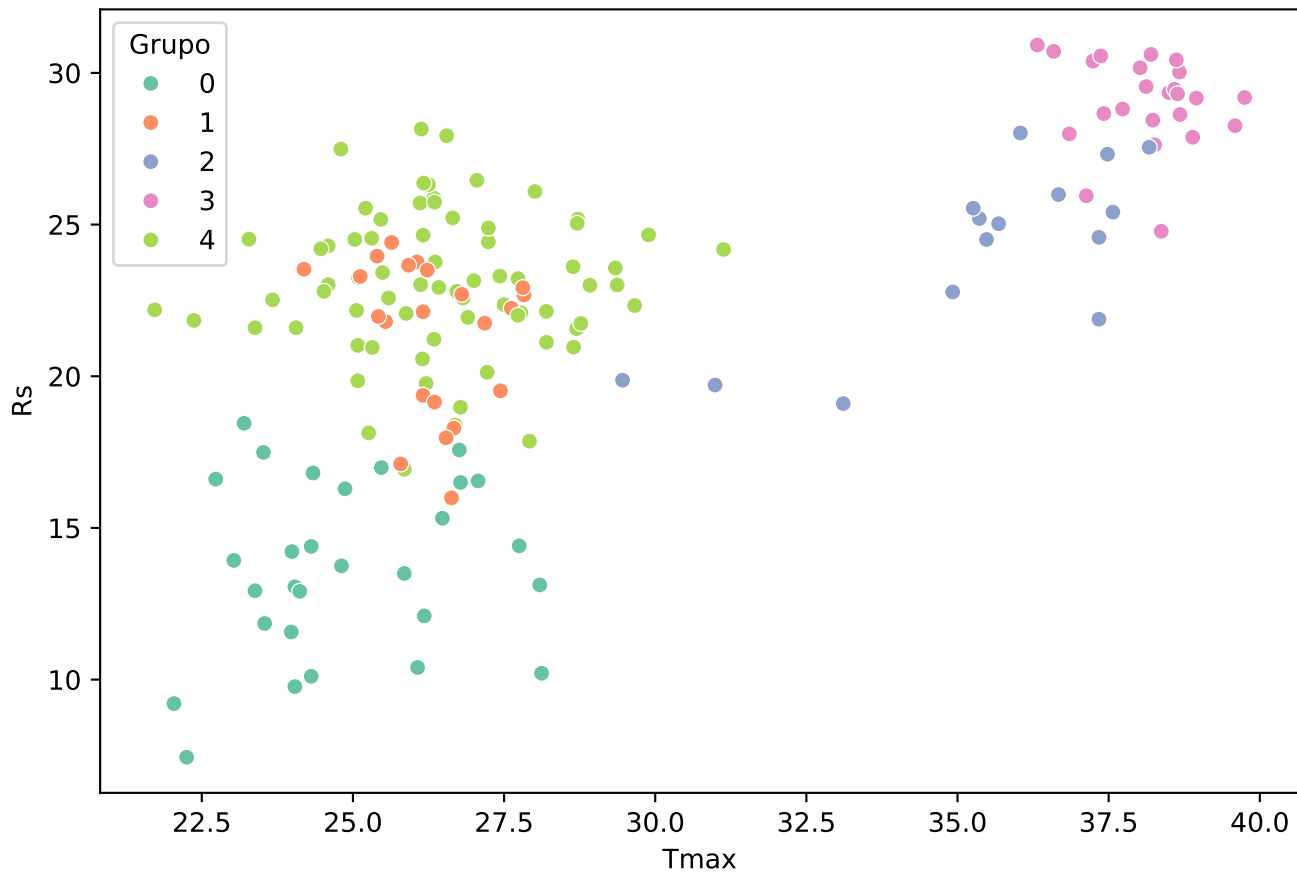




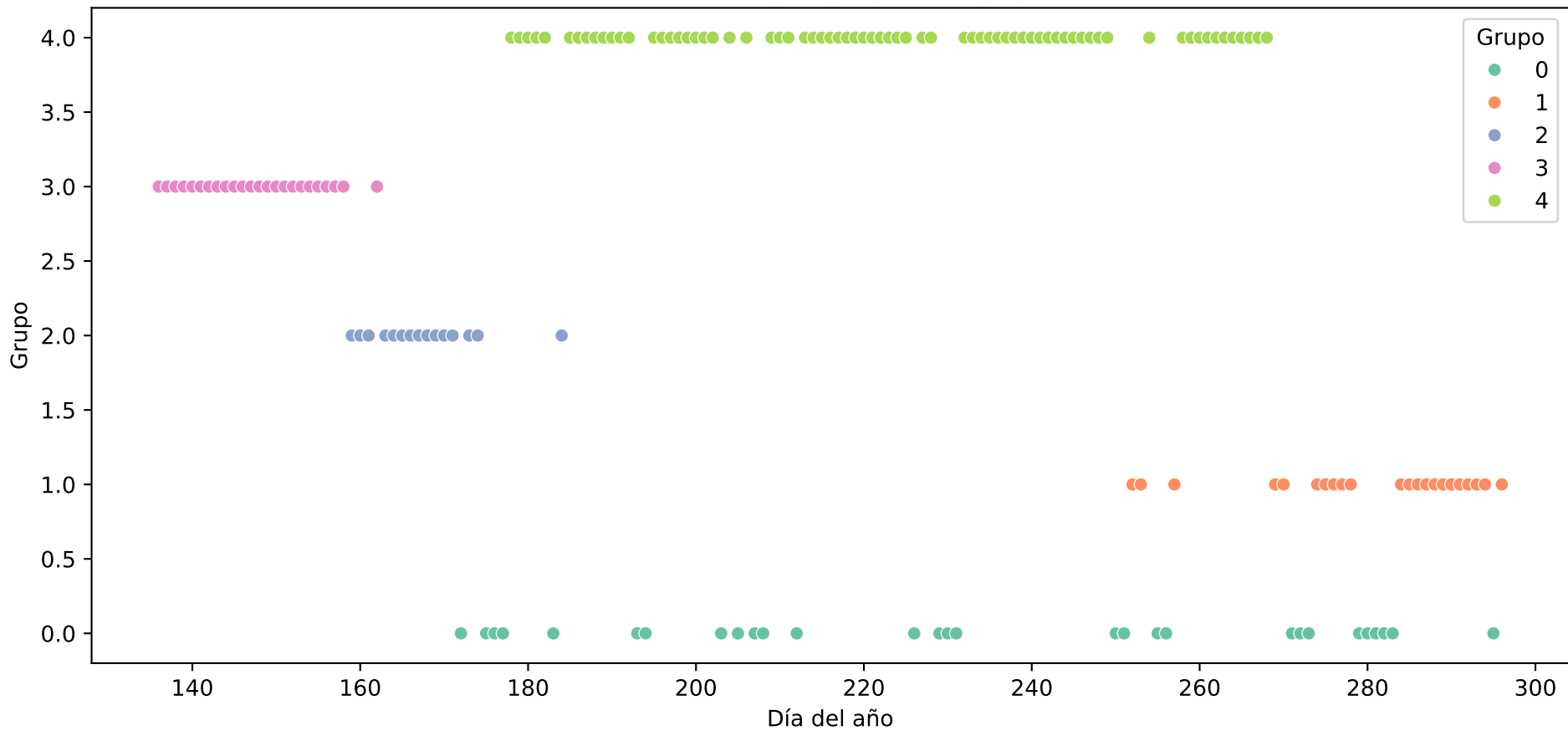
Método del codo



Clasificación de días climáticos — Zapopan (2024)

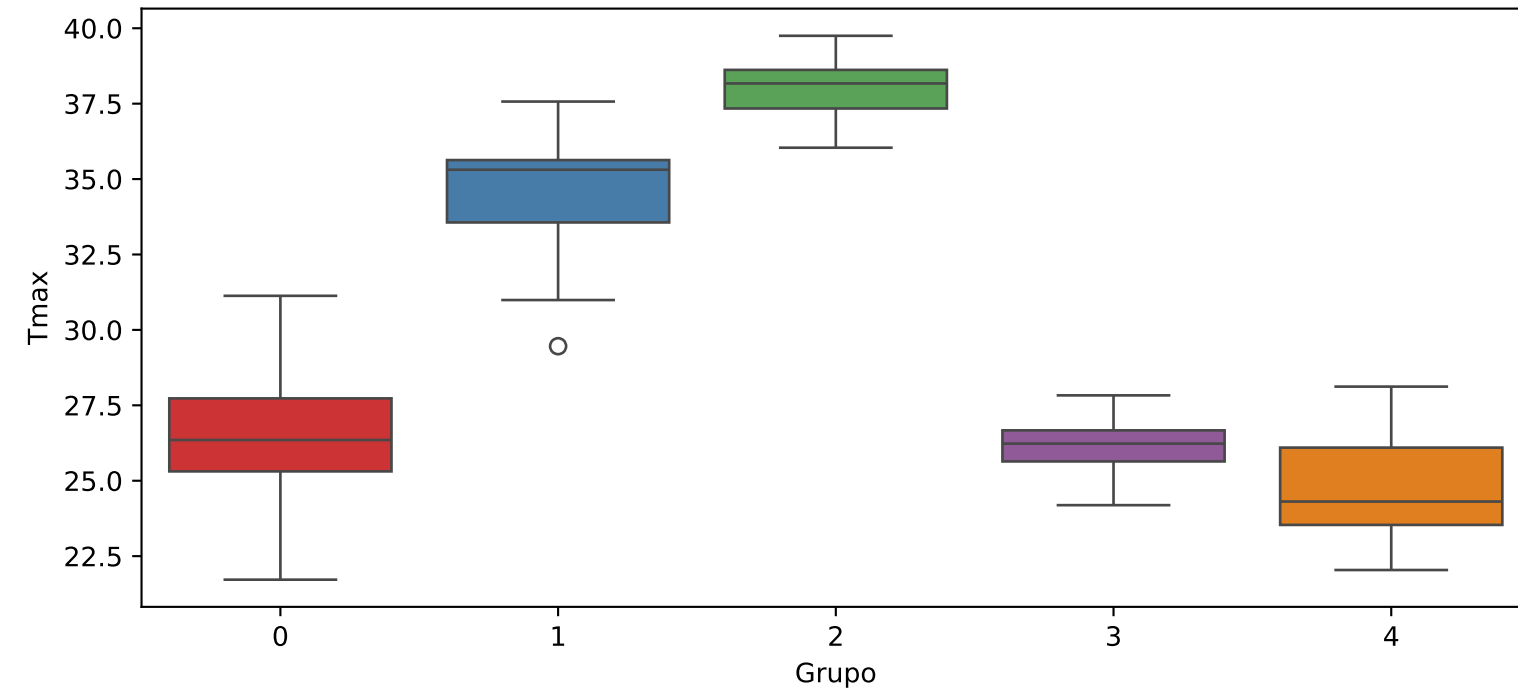


Distribución de días por grupo — Zapopan (2024)

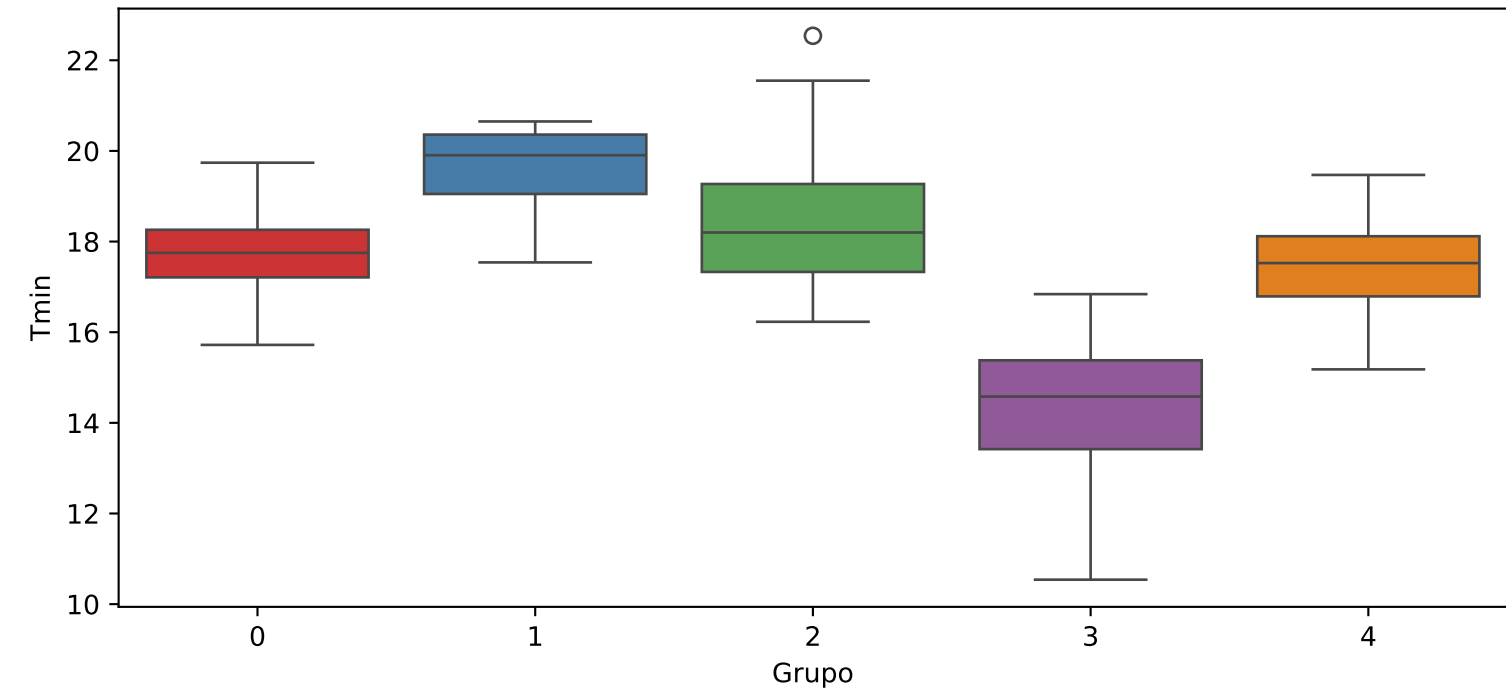


# Boxplots por grupo — Zapopan (2024)

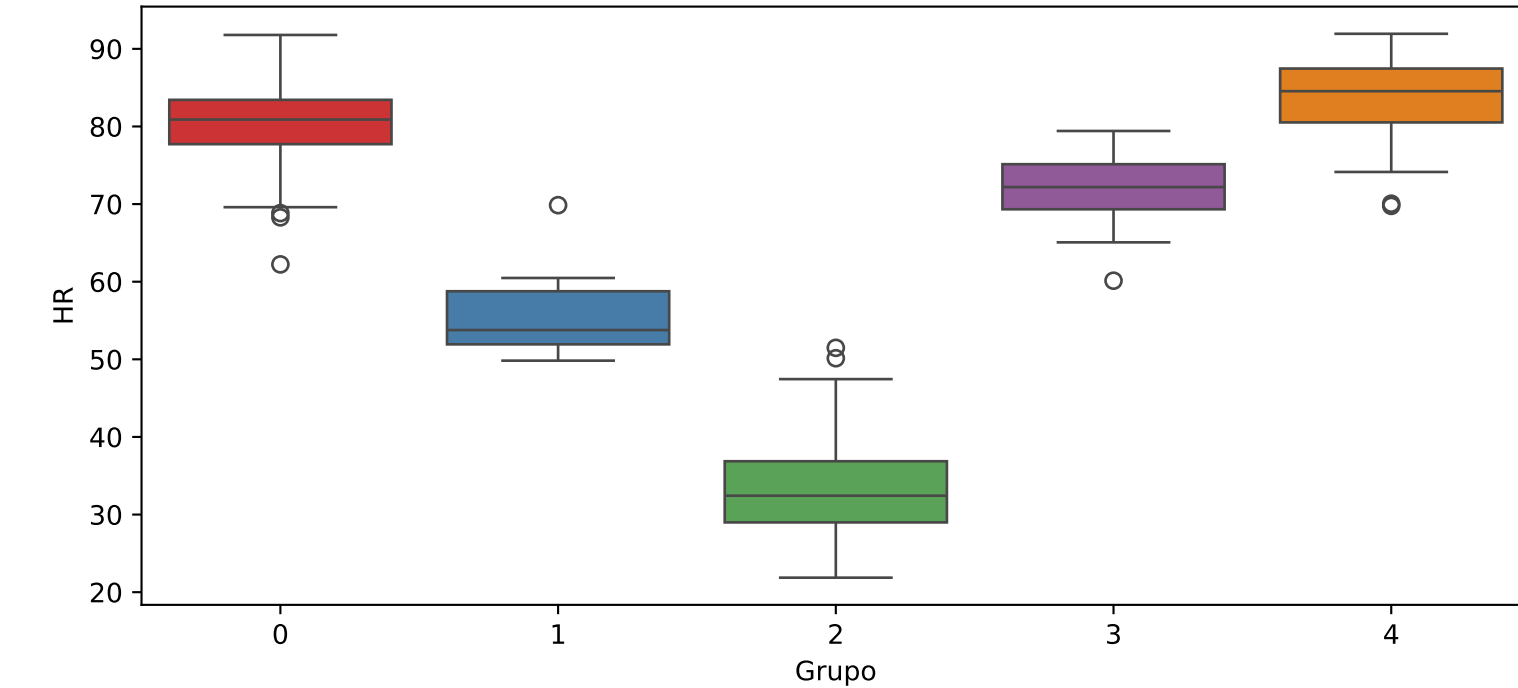
## Distribución de Tmax por grupo



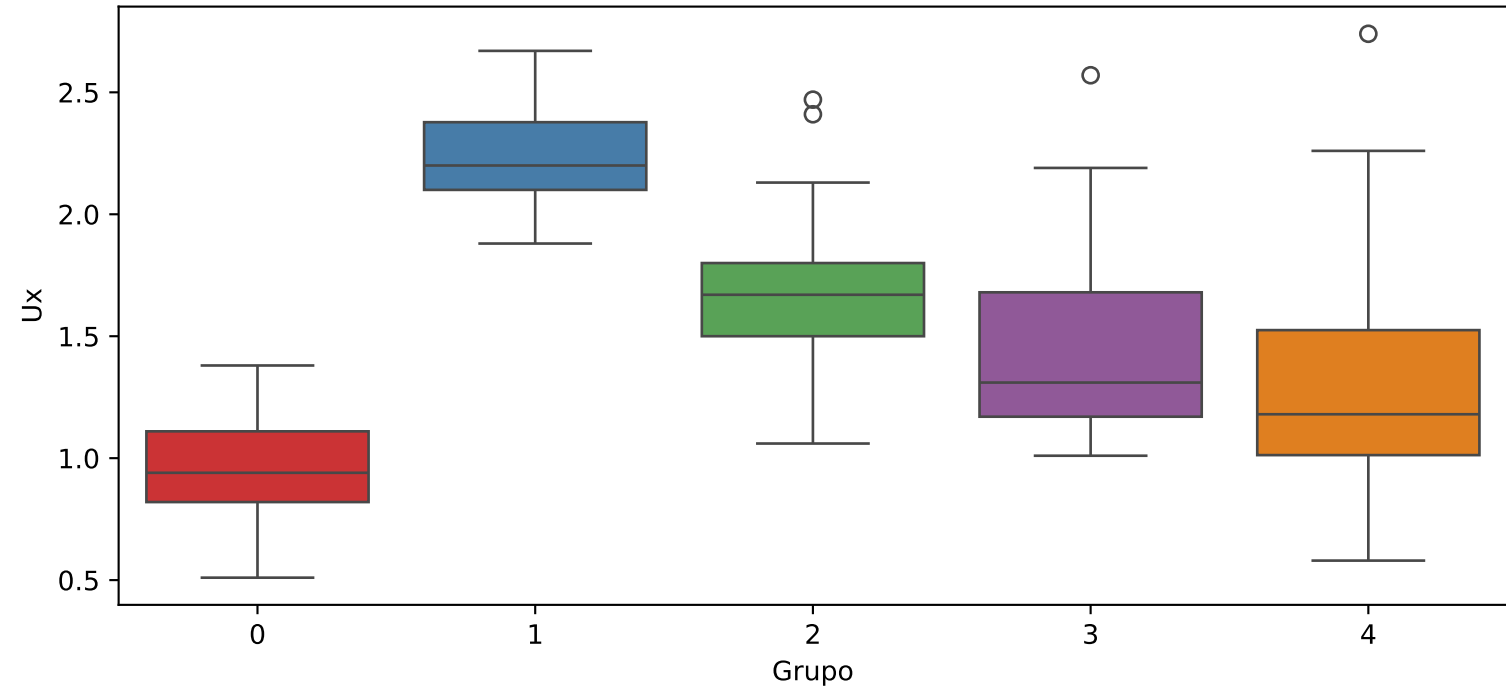
## Distribución de Tmin por grupo



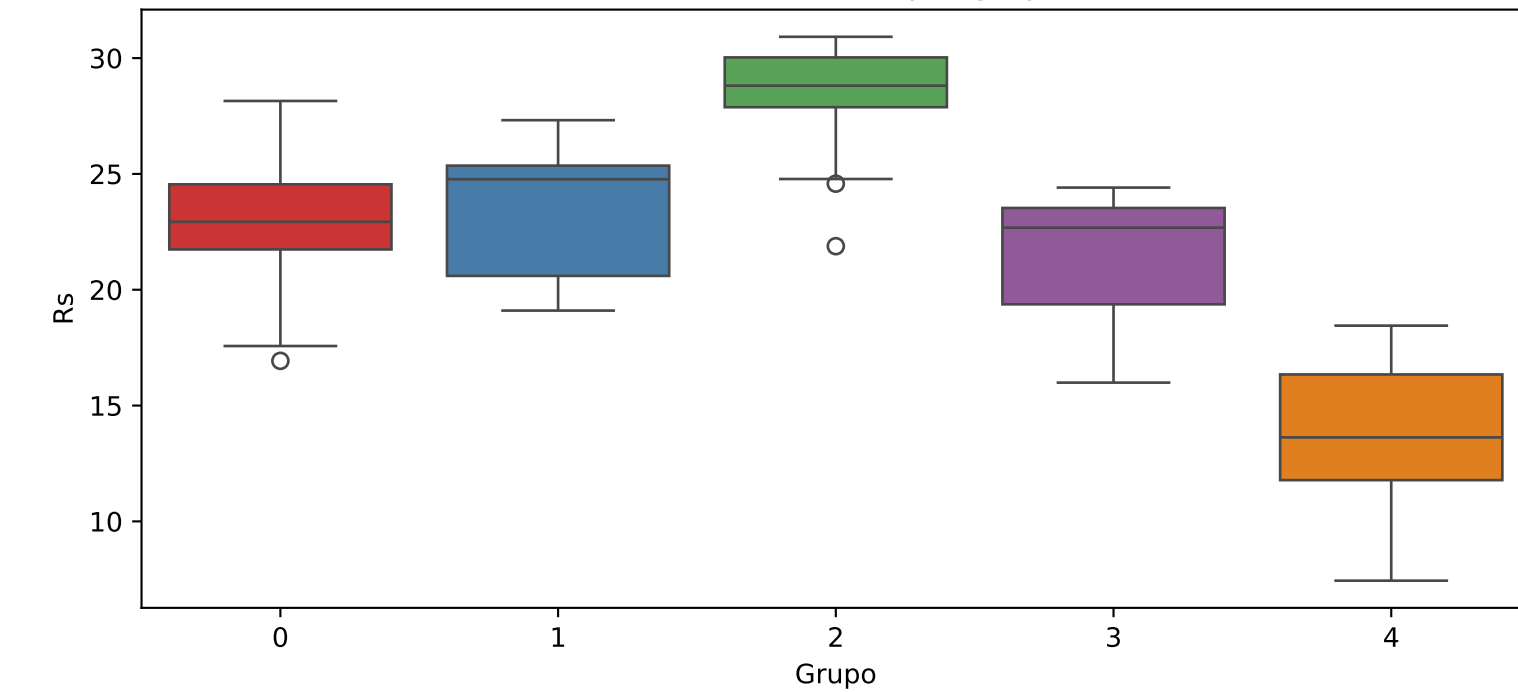
## Distribución de HR por grupo



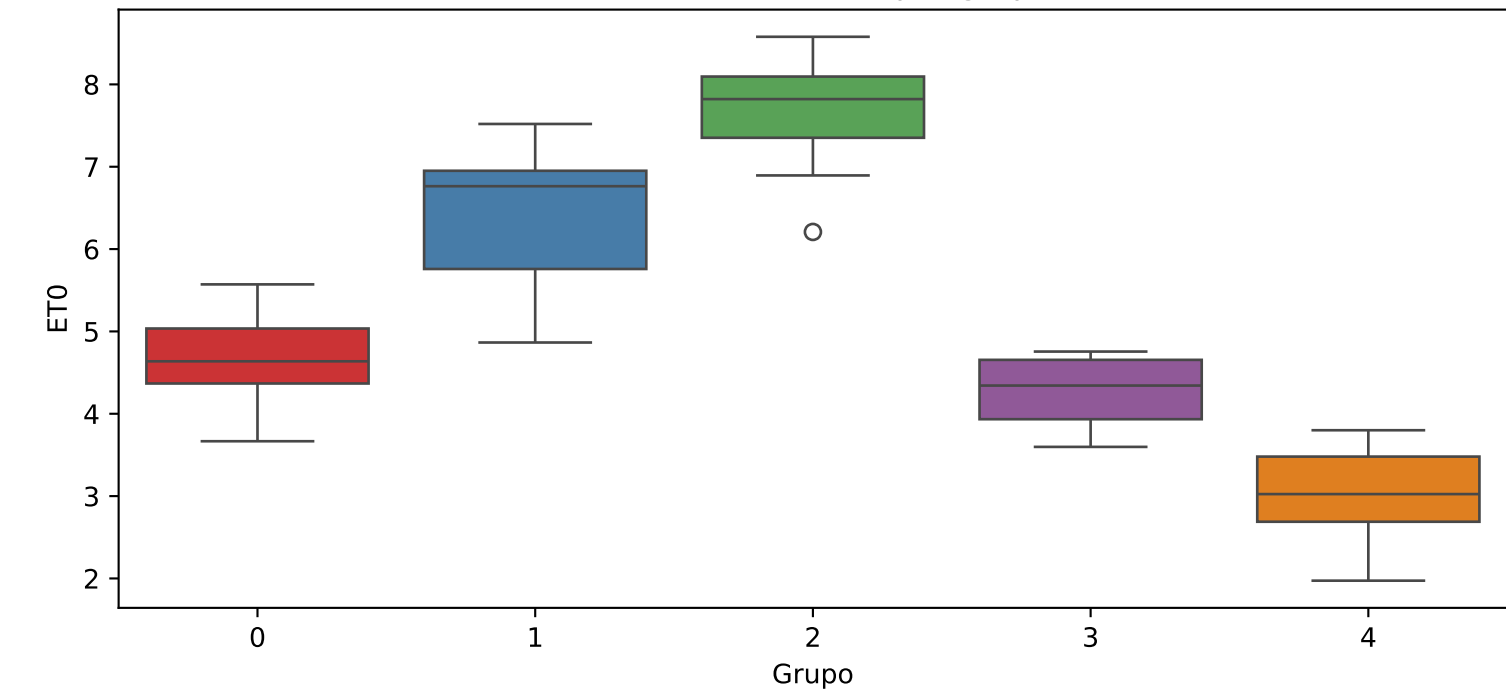
## Distribución de Ux por grupo



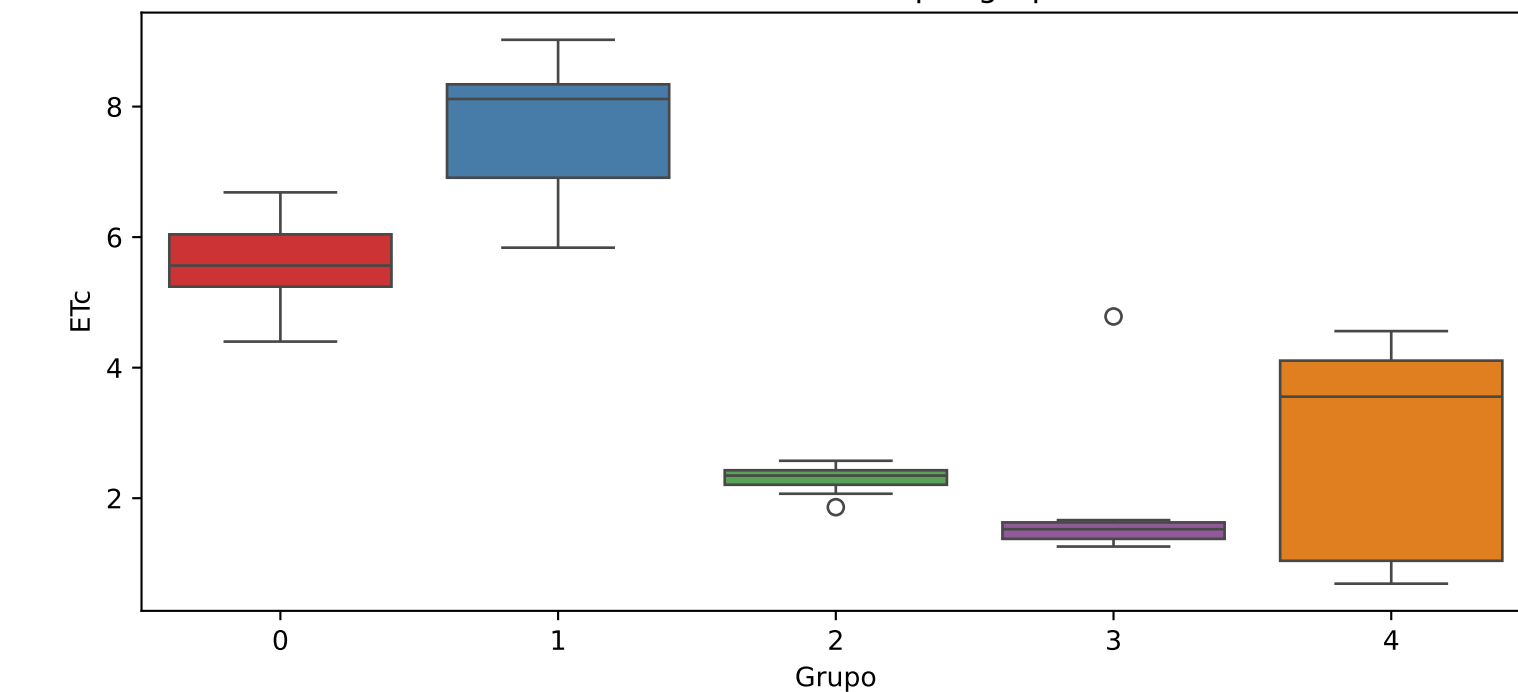
## Distribución de Rs por grupo



## Distribución de ET0 por grupo



## Distribución de ETc por grupo



Clasificación de días climáticos (ET0/ETc incluidos) — Zapopan (2024)

